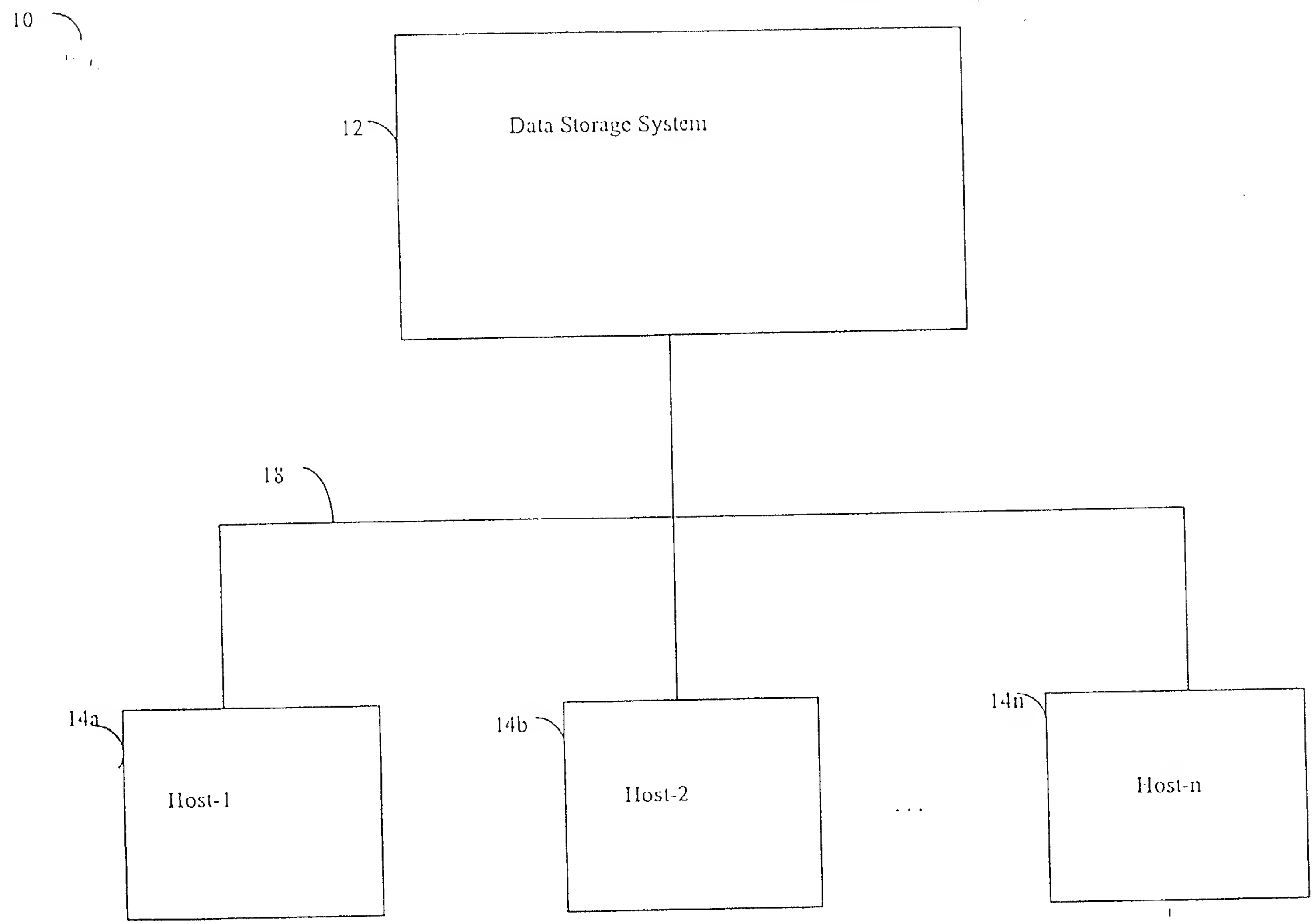



FIGURE 1

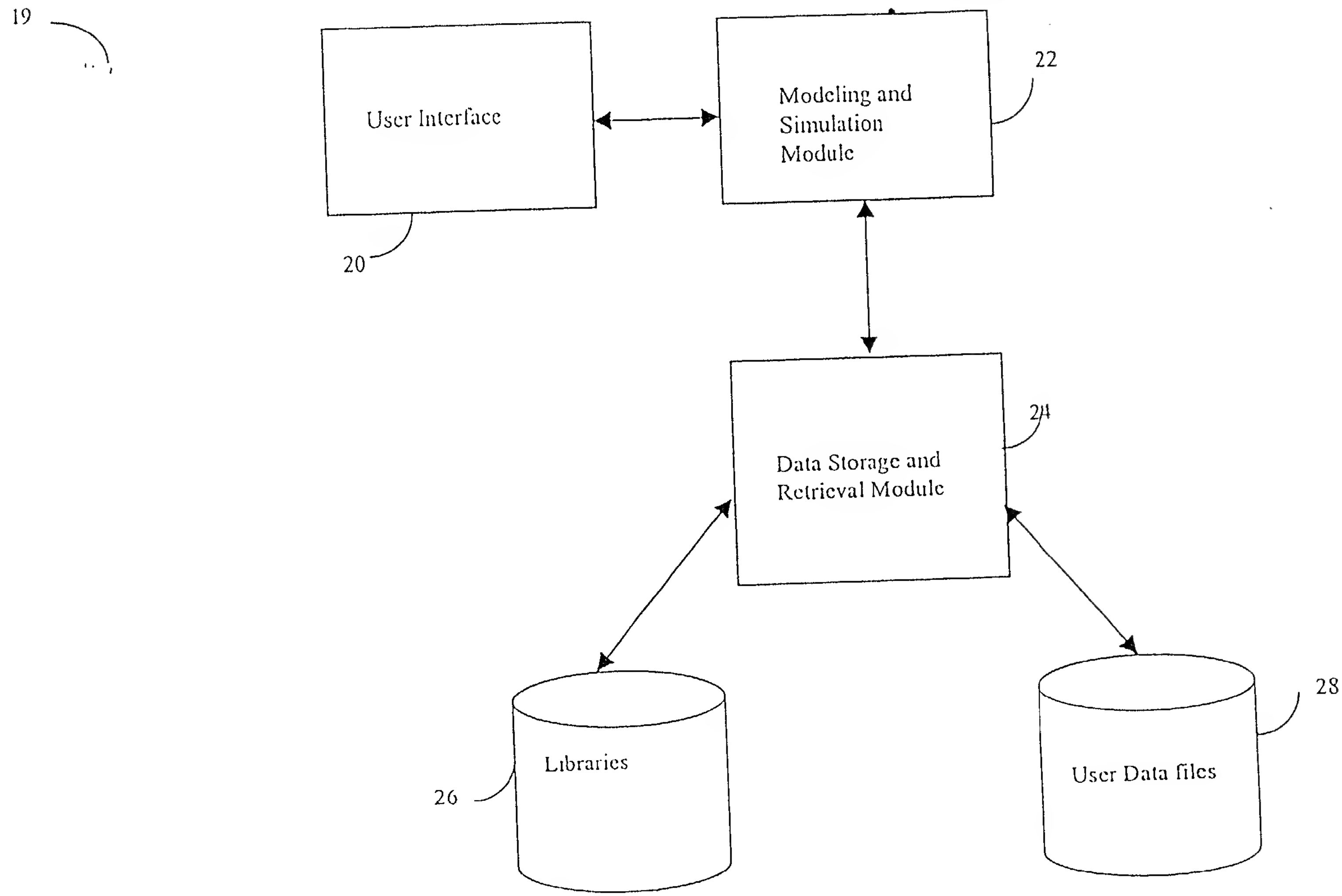
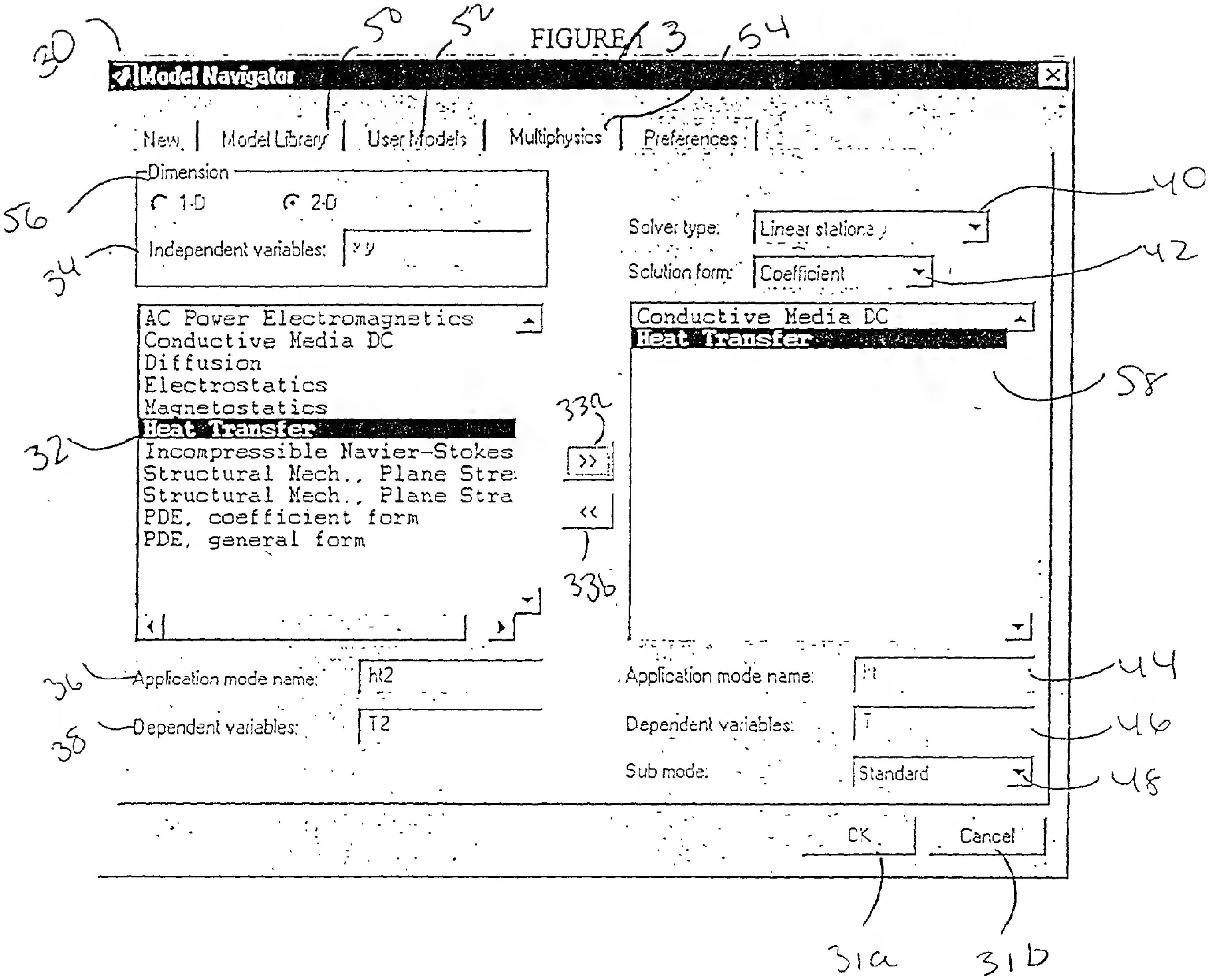

19
User Interface
20
Modeling and Simulation Module
22
Data Storage and Retrieval Module
24
Libraries
26
User Data files
28

FIGURE 2

FIGURE 3



30
50
52
54
Model Navigator
New
Model Library
User Models
Multiphysics
Preferences
Dimension
1-D
2-D
Independent variables:
x y
56
34
Solver type:
Linear stationa
Solution form:
Coefficient
40
42
AC Power Electromagnetics
Conductive Media DC
Diffusion
Electrostatics
Magnetostatics
Heat Transfer
Incompressible Navier-Stokes
Structural Mech., Plane Stre
Structural Mech., Plane Stra
PDE, coefficient form
PDE, general form
32
33a
33b
>>
<<
Conductive Media DC
Heat Transfer
58
Application mode name:
ht2
Dependent variables:
T2
36
38
Application mode name:
ht
Dependent variables:
T
Sub mode:
Standard
44
46
48
OK
Cancel
31a
31b

FIGURE ~~2~~ 4

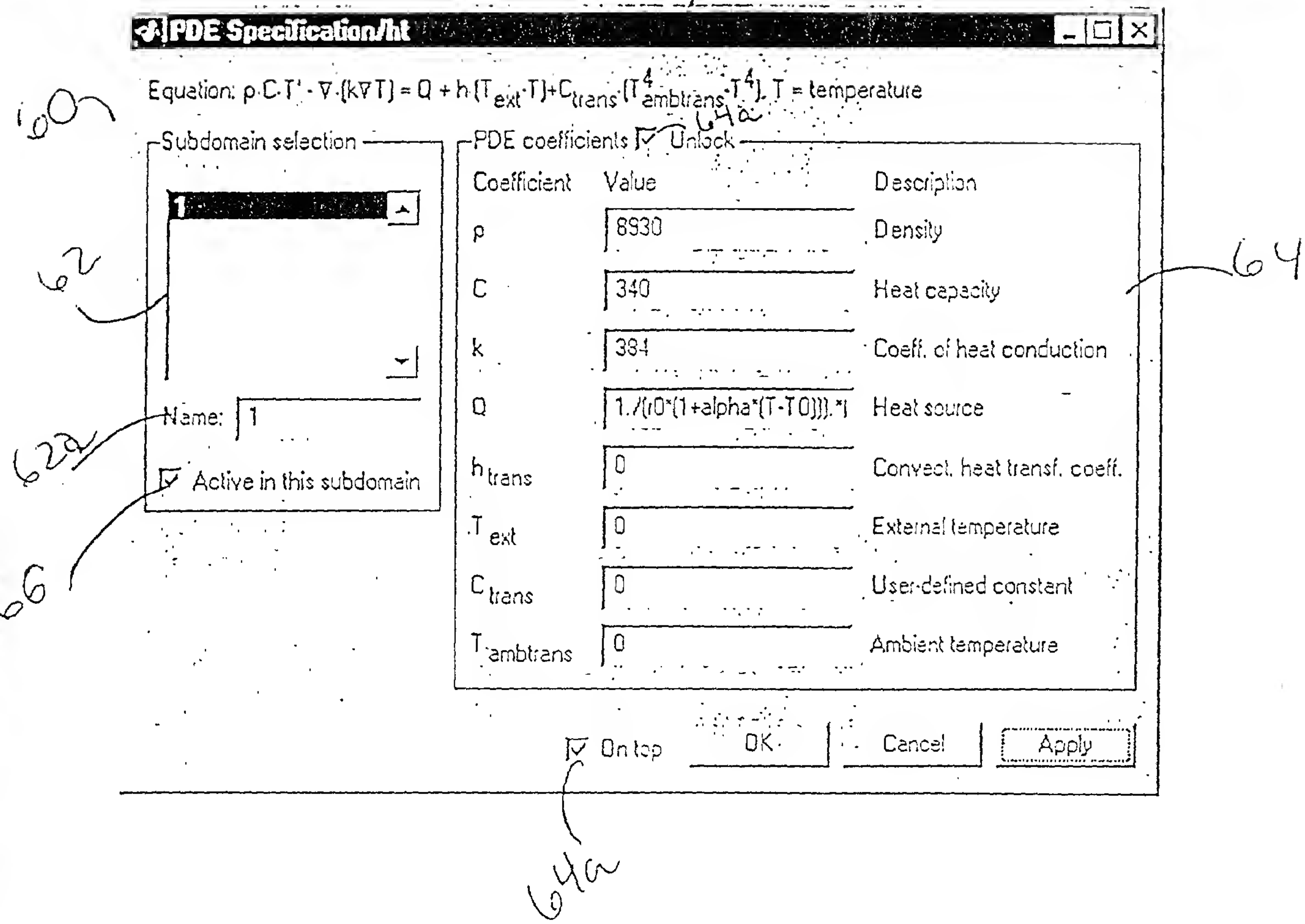

PDE Specification/ht
Equation: ρ·C·T' - ∇·(k∇T) = Q + h·(T_ext - T) + C_trans·(T^4_ambtrans - T^4), T = temperature
Subdomain selection
1
Name: 1
Active in this subdomain
PDE coefficients
Unlock
Coefficient
Value
Description
ρ
8930
Density
C
340
Heat capacity
k
384
Coeff. of heat conduction
Q
1./(r0*(1+alpha*(T-T0))).*(
Heat source
h trans
0
Convect. heat transf. coeff.
T ext
0
External temperature
C trans
0
User-defined constant
T ambtrans
0
Ambient temperature
On top
OK
Cancel
Apply
100
62
622
66
64
64a
64a

FIGURE 5

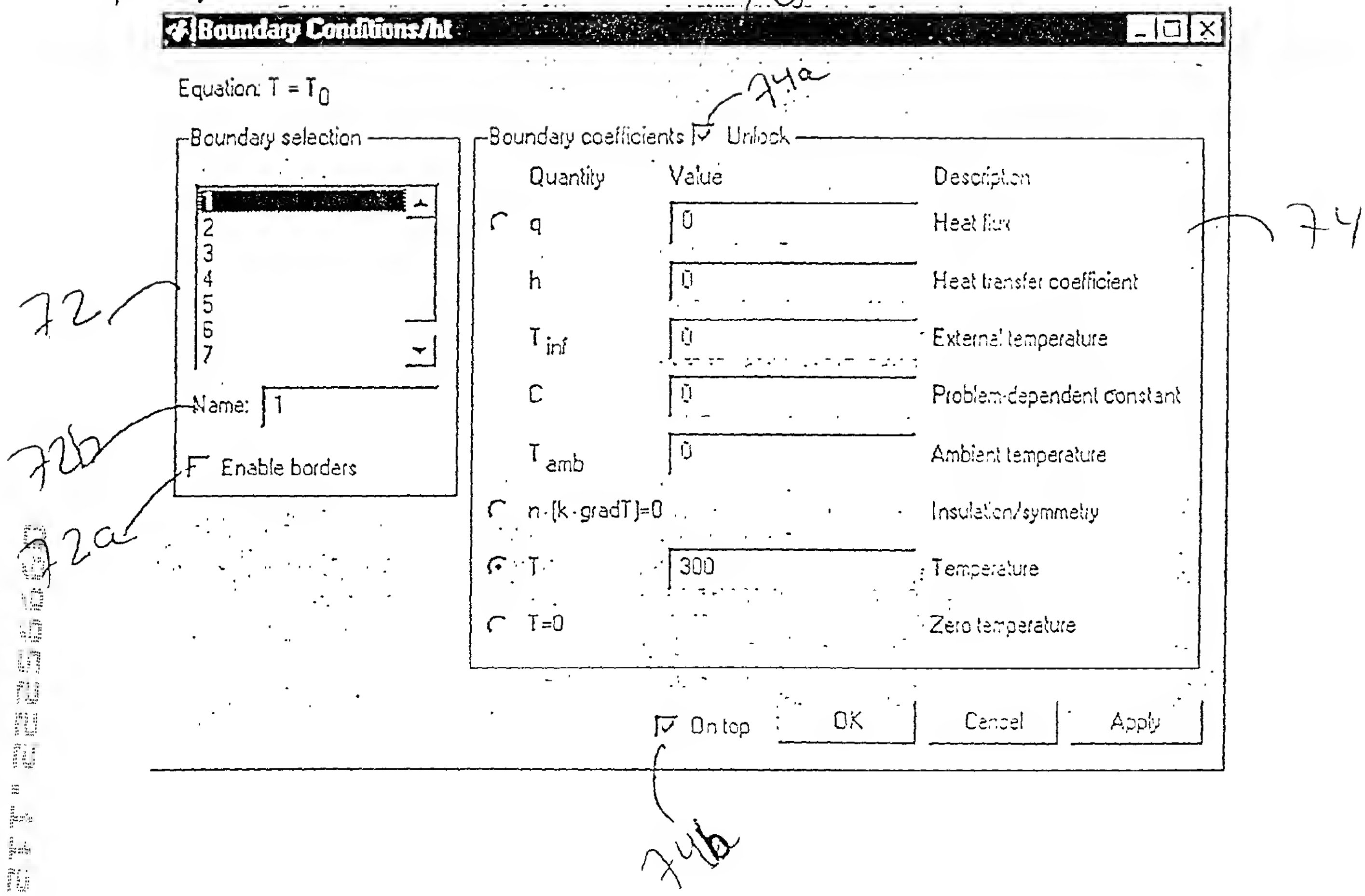
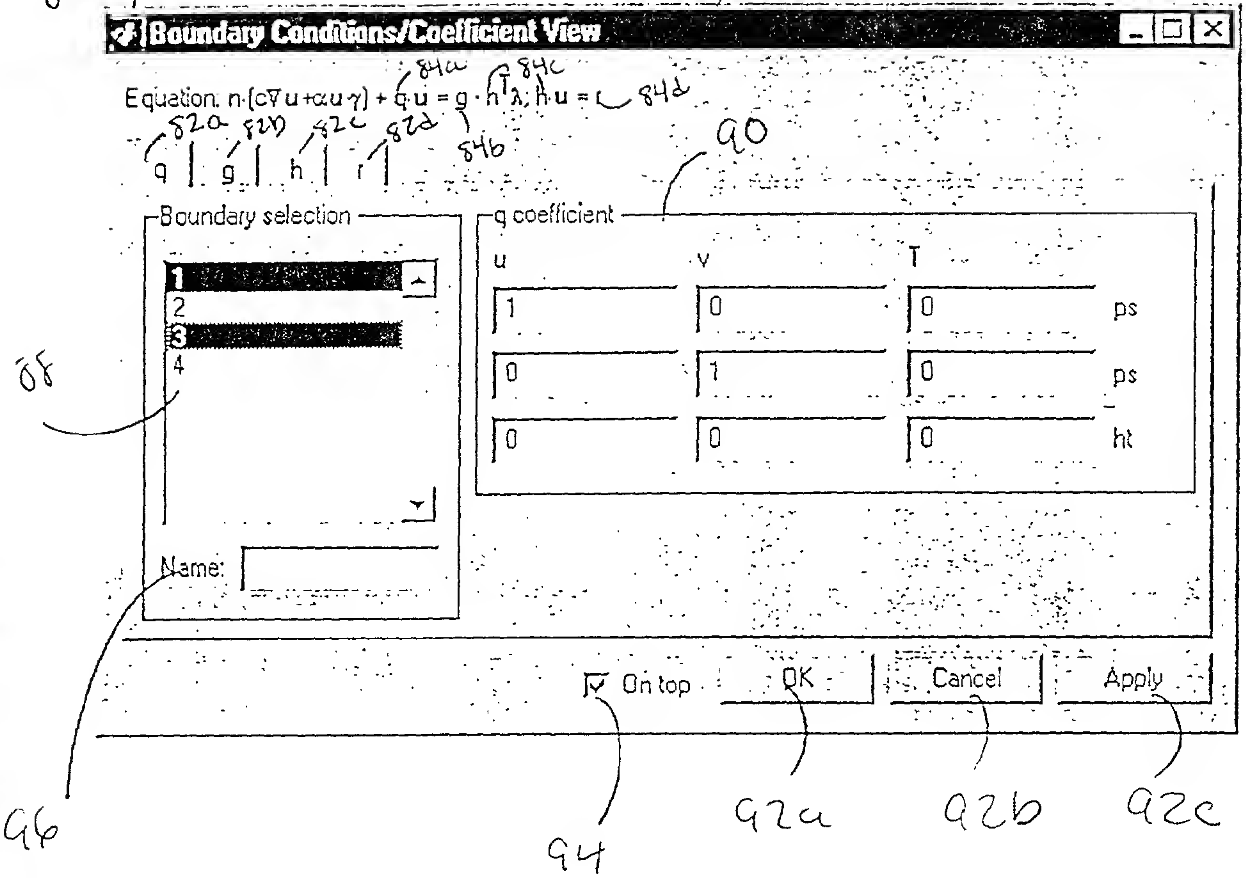

70
Boundary Conditions/ht
Equation: T = T0
Boundary selection
1
2
3
4
5
6
7
Name: 1
Enable borders
Boundary coefficients
Unlock
Quantity
Value
Description
q
0
Heat flux
h
0
Heat transfer coefficient
T inf
0
External temperature
C
0
Problem-dependent constant
T amb
0
Ambient temperature
n·(k·gradT)=0
Insulation/symmetry
T
300
Temperature
T=0
Zero temperature
On top
OK
Cancel
Apply
72
72b
72a
74a
74
74b

FIGURE ~~4~~ 6



Boundary Conditions/Coefficient View
Equation: n·(c∇u+αu-γ) + q·u = g - h^T λ; h·u = r
q
g
h
r
Boundary selection
1
2
3
4
Name:
q coefficient
u
v
T
1
0
0
ps
0
1
0
ps
0
0
0
ht
On top
OK
Cancel
Apply
80
82a
82b
82c
82d
84a
84b
84c
84d
88
90
92a
92b
92c
94
96

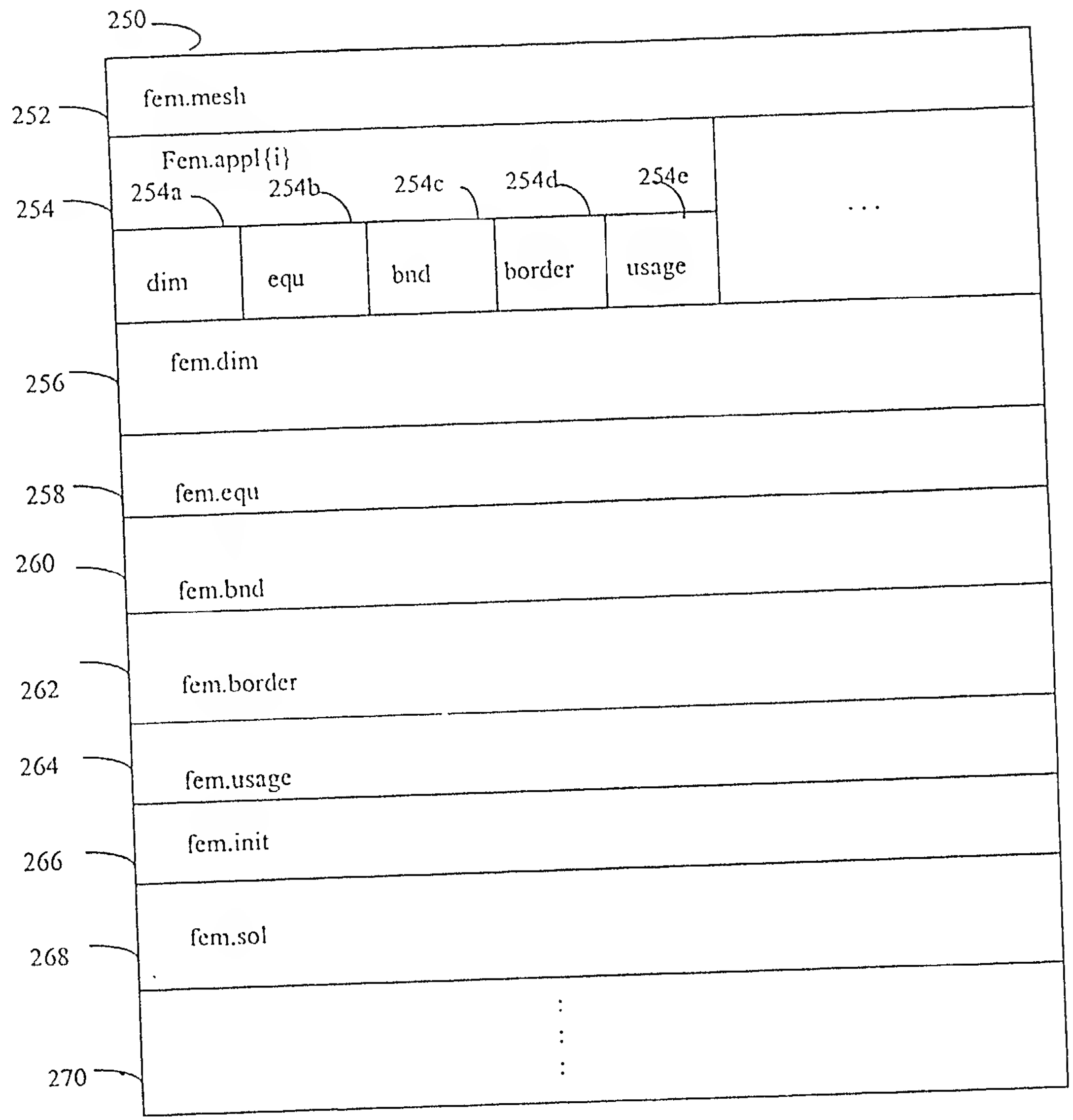

250
fem.mesh
252
Fem.appl{i}
254a
254b
254c
254d
254e
254
dim
equ
bnd
border
usage
...
fem.dim
256
fem.equ
258
fem.bnd
260
fem.border
262
fem.usage
264
fem.init
266
fem.sol
268
270

Figure 6A

FIGURE ~~5~~ 7

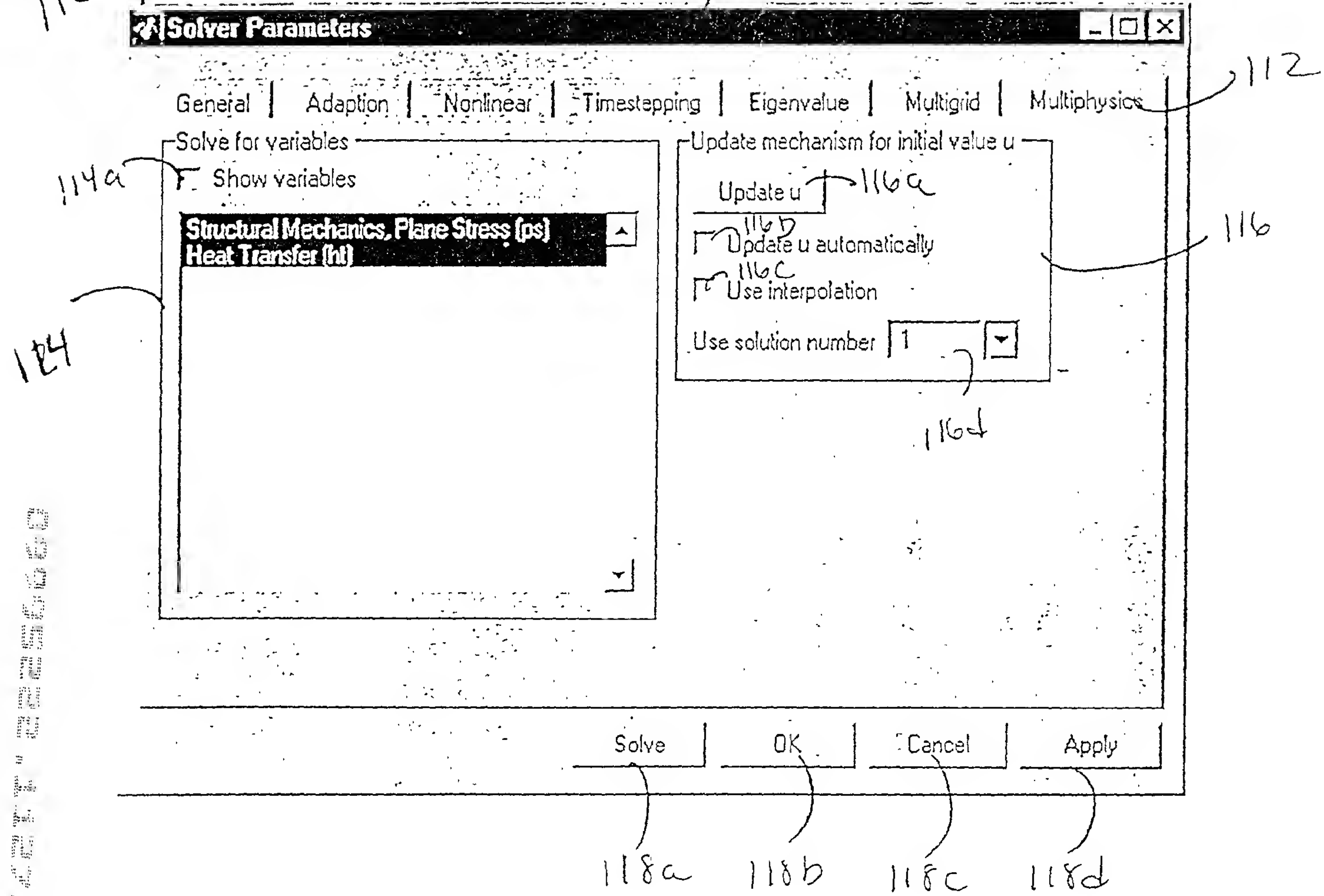

110
Solver Parameters
General
Adaption
Nonlinear
Timestepping
Eigenvalue
Multigrid
Multiphysics
112
Solve for variables
114a
Show variables
Structural Mechanics, Plane Stress (ps)
Heat Transfer (ht)
124
Update mechanism for initial value u
Update u
116a
116b
Update u automatically
116c
Use interpolation
116
Use solution number
1
116d
Solve
OK
Cancel
Apply
118a
118b
118c
118d

FIGURE ~~6~~ 8

140

$$\begin{cases} d_{a\,lk}\dfrac{\partial u_k}{\partial t} - \dfrac{\partial}{\partial x_j}\left(c_{lkji}\dfrac{\partial u_k}{\partial x_i} + \alpha_{lkj}u_k - \gamma_{lj}\right) + \beta_{lki}\dfrac{\partial u_k}{\partial x_i} + a_{lk}u_k = f_l & \Omega \quad 142 \\ n_j\left(c_{lkji}\dfrac{\partial u_k}{\partial x_i} + \alpha_{lkj}u_k - \gamma_{lj}\right) + q_{lk}u_k = g_l - h_{ml}\lambda_m & \partial\Omega \quad 146a \\ h_{ml}u_l = r_m & \partial\Omega \quad 146b \end{cases}$$

146

FIGURE ~~7~~ 9

150

$$\begin{cases} d_{a\,lk}\dfrac{\partial u_k}{\partial t} + \dfrac{\partial \Gamma_{lj}}{\partial x_j} = F_l & \Omega \quad 152 \\ -n_j\Gamma_{lj} = G_l + \dfrac{\partial R_m}{\partial u_l}\lambda_m & \partial\Omega \quad 154a \\ 0 = R_m & \partial\Omega \quad 154b \end{cases}$$

154

FIGURE 10

324

1

$$
\begin{cases}
\gamma_{Ij} = \Gamma_{Ij} & f_I = F_I \\[6pt]
c_{Ikjl} = -\dfrac{\partial \Gamma_{Ij}}{\partial\left(\dfrac{\partial u_k}{\partial x_i}\right)} & \alpha_{Ikj} = -\dfrac{\partial \Gamma_{Ij}}{\partial u_k} \\[6pt]
\beta_{Iki} = -\dfrac{\partial F_I}{\partial\left(\dfrac{\partial u_k}{\partial x_i}\right)} & a_{Ik} = -\dfrac{\partial F_I}{\partial u_k} \\[6pt]
g_I = G_I & r_I = R_I \\[6pt]
q_{Ik} = -\dfrac{\partial G_I}{\partial u_k} & h_{Ik} = -\dfrac{\partial R_I}{\partial u_k}
\end{cases}
$$

FIGURE ~~8~~ 11

$$240\left\{\begin{aligned}
\Gamma_{lj} &= -c_{lkji}\frac{\partial u_k}{\partial x_i} - \alpha_{lkj}u_k + \gamma_{lj} \\
F_l &= f_l - \beta_{lki}\frac{\partial u_k}{\partial x_i} - a_{lk}u_k \\
G_l &= g_l - q_{lk}u_k \\
R_m &= r_m - h_{ml}u_l
\end{aligned}\right.$$

FIG 12

$$
\begin{cases}
\int_{\Omega}\left(\left(c_{lkji}\dfrac{\partial u_k}{\partial x_i}+\alpha_{lkj}u_k\right)\dfrac{\partial v}{\partial x_j}+\left(d_{a\,lk}\dfrac{\partial u_k}{\partial t}+\beta_{lki}\dfrac{\partial u_k}{\partial x_i}+a_{lk}u_k\right)v\right)dx+ \\
\int_{\partial\Omega} q_{lk}u_k v\,ds=\int_{\Omega}\left(\gamma_{lj}\dfrac{\partial v}{\partial x_j}+f_l v\right)dx+\int_{\partial\Omega}(g_l-h_{ml}\lambda_m)v\,ds \\
\int_{\partial\Omega}\mu h_{mk}u_k\,ds=\int_{\partial\Omega}\mu r_m\,ds
\end{cases}
$$

FIG 13

302

$$\begin{cases} \int_{\Omega}\left(\Gamma_{lj}\frac{\partial v}{\partial x_j}+F_l v-d_{alk}\frac{\partial u_k}{\partial t}v\right)dx+\int_{\partial\Omega}\left(G_l+\frac{\partial R_m}{\partial u_l}\lambda_m\right)v\,ds=0 \\ \int\limits_{\partial\Omega} R_m\,\mu\,ds=0 \end{cases}$$

FIG 14

304

$$U_k(x) = \sum_{I=1}^{N_p} U_{I,k}\phi_I(x), \qquad \Lambda_m(x) = \sum_{K=1}^{N_e} \sum_{L=1}^{n} \Lambda_{K,L,m}\Psi_{K,L}(x)$$

FIG 15

$$
206\left\{
\begin{aligned}
&\int_{\tau}\left(c_{lkji}U_{I,k}\frac{\partial\phi_I}{\partial x_i}+\alpha_{lkj}U_{I,k}\phi_I\right)\frac{\partial\phi_J}{\partial x_j}\,dx\;+\\
&\int_{\tau}\left(d_{a\,lk}\frac{\partial U_{I,k}}{\partial t}\phi_I+\beta_{lki}U_{I,k}\frac{\partial\phi_I}{\partial x_i}+a_{lk}U_{I,k}\phi_I\right)\phi_J\,dx\;+\\
&\int_{\partial\tau}q_{lk}U_{I,k}\phi_I\phi_J\,ds=\int_{\tau}\left(\gamma_{lj}\frac{\partial\phi_J}{\partial x_j}+f_l\phi_J\right)dx\;+\\
&\int_{\partial\tau}(g_l-h_{ml}\Lambda_{K,L,m}\Psi_{K,L})\phi_J\,ds
\end{aligned}
\right.
$$

FIG 16

308

$$\int_{\partial\tau} h_{mk} U_{I,k} \phi_I \Psi_{K,L}\, ds = \int_{\partial\tau} r_m \Psi_{K,L}\, ds$$

FIG 17

$$312\quad \begin{cases} \int_{\tau}\left(\Gamma_{Ij}\dfrac{\partial\phi_J}{\partial x_j} + F_I\phi_J - d_{aIk}\dfrac{\partial u_k}{\partial t}\phi_J\right)\,dx + \int_{\partial\tau}\left(G_I + \dfrac{\partial R_m}{\partial u_I}\Lambda_{K,L,m}\Psi_{K,L}\right)\phi_J\,ds = 0 \\ \int_{\partial\tau} R_m\Psi_{K,L}\,ds = 0 \end{cases}$$

FIG 18

310

$$DA_{(J,I),(I,k)} = \int_\tau d_{a\,Ik}\phi_I\phi_J\,dx$$

$$C_{(J,I),(I,k)} = \int_\tau c_{Ikji}\frac{\partial\phi_I}{\partial x_i}?\frac{\partial\phi_J}{\partial x_j}\,dx$$

$$AL_{(J,I),(I,k)} = \int_\tau \alpha_{Ikj}\phi_I?\frac{\partial\phi_J}{\partial x_j}\,dx$$

$$BE_{(J,I),(I,k)} = \int_\tau \beta_{Iki}\frac{\partial\phi_I}{\partial x_i}\phi_J\,dx$$

$$A_{(J,I),(I,k)} = \int_\tau a_{Ik}\phi_I\phi_J\,dx$$

$$Q_{(J,I),(I,k)} = \int_{\partial\tau} q_{Ik}\phi_I\phi_J\,ds$$

$$GA_{(J,I)} = \int_\tau \gamma_{Ij}\frac{\partial\phi_J}{\partial x_j}\,dx$$

$$F_{(J,I)} = \int_\tau f_I\phi_J\,dx$$

$$G_{(J,I)} = \int_{\partial\tau} g_I\phi_J\,ds$$

$$H_{(K,L,m),(I,k)} = \int_{\partial\tau} h_{mk}\phi_I\Psi_{K,L}\,ds$$

$$R_{(K,L,m)} = \int_{\partial\tau} r_m\Psi_{K,L}\,ds$$

FIG 19

$$\begin{cases} DA\dfrac{\partial U}{\partial t} + (C + AL + BE + A + Q)U + H^T\Lambda = GA + F + G \\ HU = R \end{cases}$$

FIG 20

$$\begin{cases} DA\dfrac{\partial U}{\partial t} + H^T\Lambda = GA + F + G \\ R = 0 \end{cases}$$

FIG 21

$$326\left\{\begin{array}{l} J(U^{(k)})\Delta U^{(k)} = -\rho(U^{(k)}) \\ U^{(k+1)} = U^{(k)} + \lambda_k \Delta U^{(k)} \end{array}\right.$$

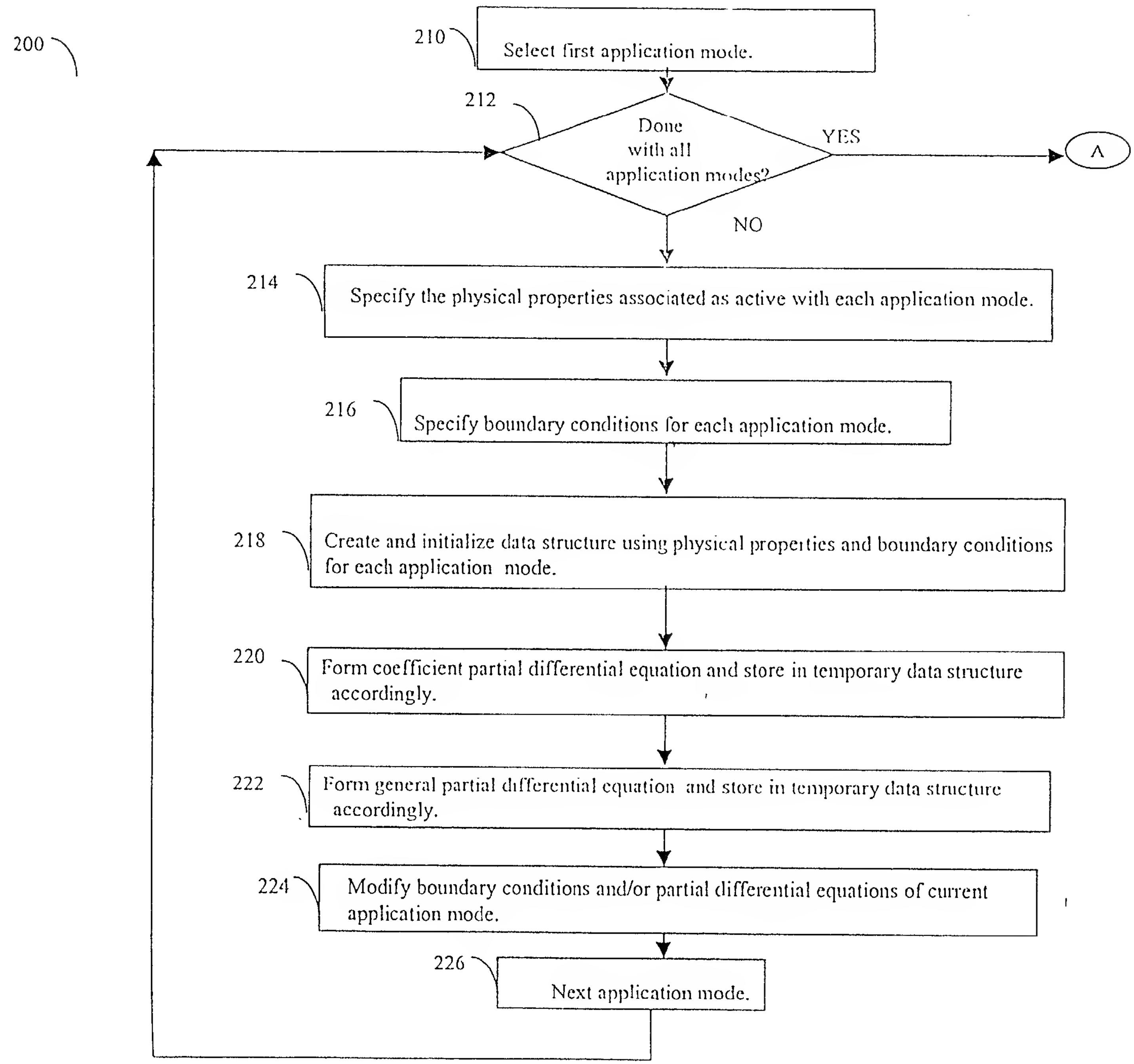

200
210
Select first application mode.
212
Done
with all
application modes?
YES
A
NO
214
Specify the physical properties associated as active with each application mode.
216
Specify boundary conditions for each application mode.
218
Create and initialize data structure using physical properties and boundary conditions for each application mode.
220
Form coefficient partial differential equation and store in temporary data structure accordingly.
222
Form general partial differential equation and store in temporary data structure accordingly.
224
Modify boundary conditions and/or partial differential equations of current application mode.
226
Next application mode.

Figure 22

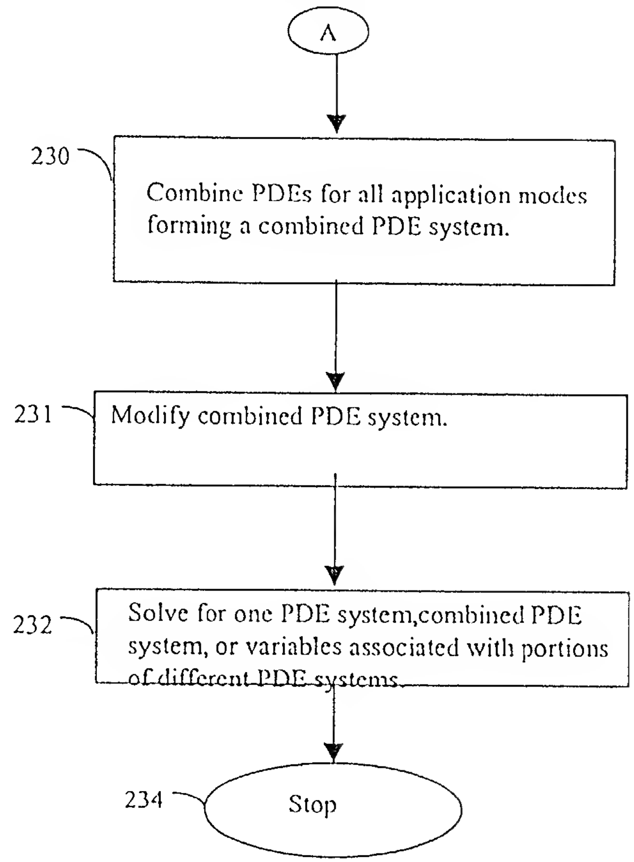
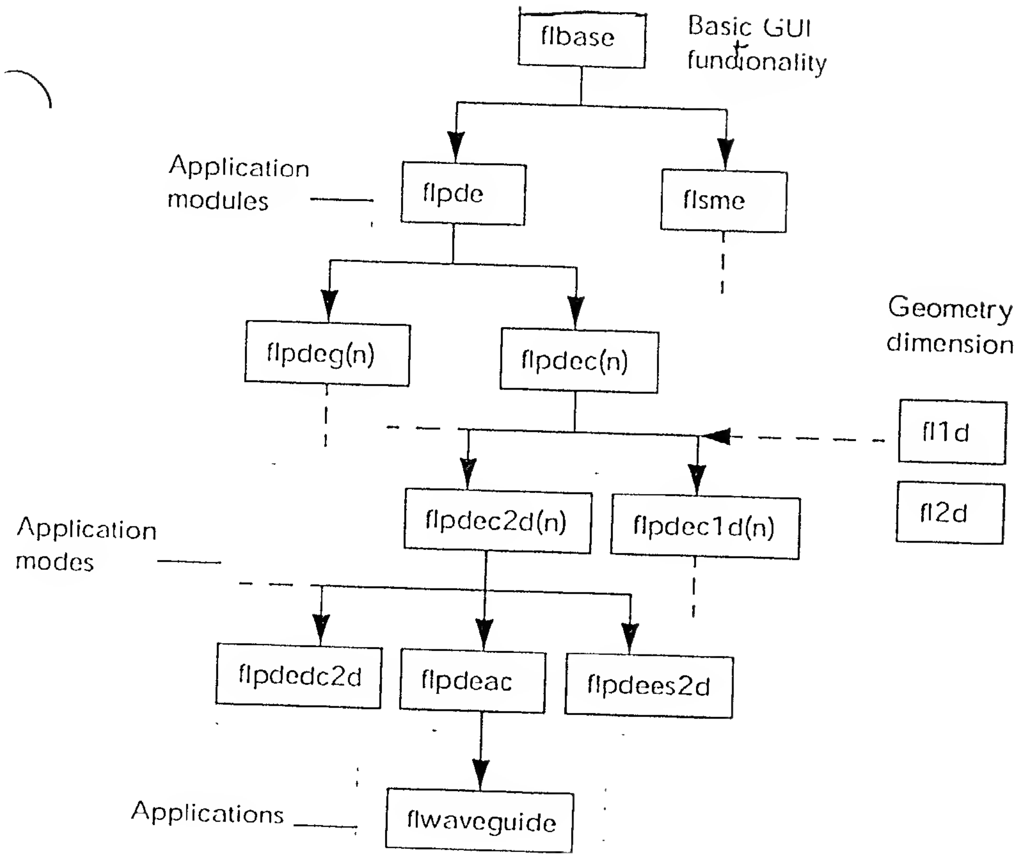

A
230
Combine PDEs for all application modes forming a combined PDE system.
231
Modify combined PDE system.
232
Solve for one PDE system,combined PDE system, or variables associated with portions of different PDE systems.
234
Stop

FIGURE 23

500




**The class hierarchy of FEMLAB**

FIGURE 24

1-D Physics Application Modes

| Application mode | Class name | Parent class |
|---|---|---|
| Diffusion | `flpdedf1d` | `flpdedf` |
| Heat Transfer | `flpdeht1d` | `flpdeht` |

502

: 1-D PDE Application Modes

| Application mode | Class name | Parent class |
|---|---|---|
| Coefficient PDE model, n variables | `flpdec1d`*(n)* | `flpdec`*(n)* |
| General PDE model, n variables | `flpdeg1d`*(n)* | `flpdeg`*(n)* |

504

FIGURE 25

2-D Physics Application Modes

| Application mode | Class name | Parent class |
|---|---|---|
| AC Power Electromagnetics | `flpdeac` | `flpdec2d` |
| Conductive Media DC | `flpdedc2d` | `flpdedc` |
| Diffusion | `flpdedf2d` | `flpdedf` |
| Electrostatics | `flpdees2d` | `flpdees` |
| Magnetostatics | `flpdems2d` | `flpdems` |
| Heat Transfer | `flpdeht2d` | `flpdeht` |
| Incompressible Navier-Stokes | `flpdens2d` | `flpdens` |
| Structural Mechanics, Plane Stress | `flpdeps` | `flpdec2d` |
| Structural Mechanics, Plane Strain | `flpdepn` | `flpdec2d` |

506

PDE Application Modes

| Application mode | Class name | Parent class |
|---|---|---|
| Coefficient PDE model, n variables | `flpdec2d`*(n)* | `flpdec`*(n)* |
| General PDE model, n variables | `flpdeg2d`*(n)* | `flpdeg`*(n)* |

508

FIGURE 26

FIGURE 27

**Application Object Properties**

| Property name | Description | Data type |
|---|---|---|
| `dim` | Names of the dependent variables | Cell array of strings |
| `form` | PDE form | String (`coefficient/general`) |
| `name` | Application name | String |
| `parent` | Parent class names | String, cell array of strings, or the empty matrix |
| `sdim` | Names of the independent variables (space dimensions) | Cell array of strings |
| `submode` | Name of current submode | String (std/wave) |
| `tdiff` | Time differentiation flag | String (on/off) |

510

```
function obj = myapp()
%MYAPP Constructor for a FEMLAB application object.

obj.name = 'My first FEMLAB application';
obj.parent = 'flpdeht2d';

% MYAPP is a subclass of FLPDEHT2D:
p1 = flpdeht2d;
obj = class(obj,'myapp',p1);
set(obj,'dim',default_dim(obj));
```

512

FIGURE 28

Physics Modeling Methods

| Function | Purpose |
|---|---|
| appspec | Return application specifications. |
| bnd_compute | Convert application-dependent boundary conditions to generic boundary coefficients. |
| default_bnd | Default boundary conditions. |
| default_dim | Default names of dependent variables. |
| default_equ | Default PDE coefficients/Material parameters. |
| default_init | Default initial conditions. |
| default_sdim | Default space dimension variables. |
| default_var | Default application scalar variables. |
| dim_compute | Return dependent variables for an application. |
| equ_compute | Convert application-dependent material parameters to generic PDE coefficients. |
| form_compute | Return PDE form. |
| init_compute | Convert application-dependent initial conditions to generic initial conditions. |
| posttable | Define assigned variable names and post-processing information. |

514

FIGURE 29

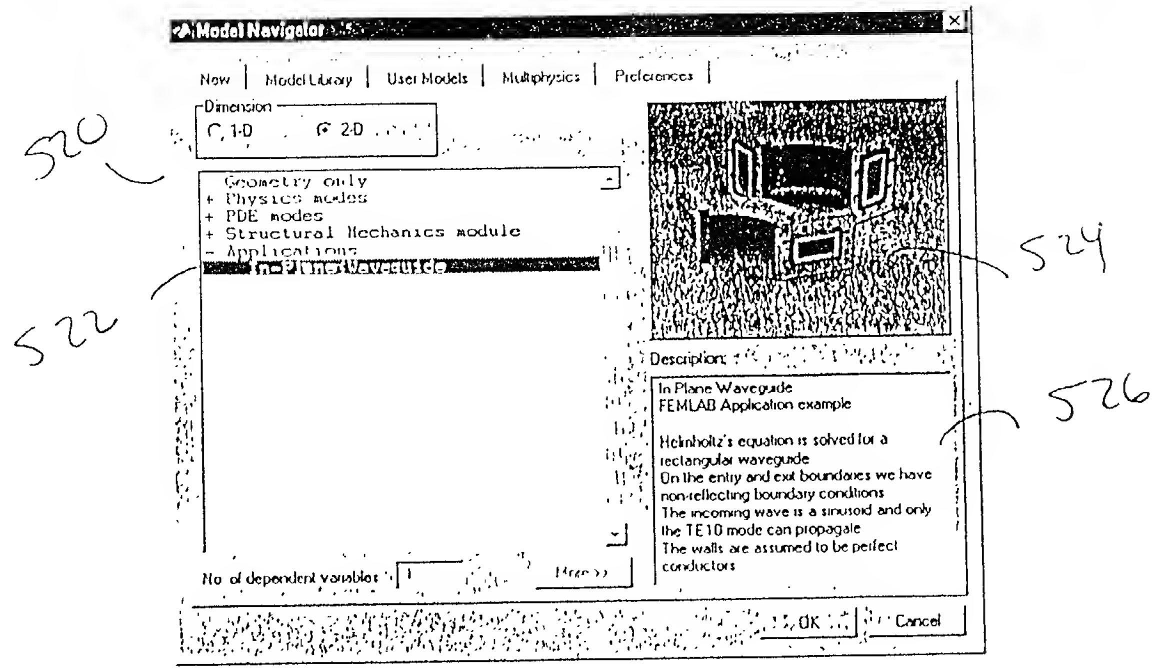

Model Navigator
New
Model Library
User Models
Multiphysics
Preferences
Dimension
1-D
2-D
Geometry only
+ Physics modes
+ PDE modes
+ Structural Mechanics module
- Applications
In Plane Waveguide
No of dependent variables
1
More >>
Description:
In Plane Waveguide
FEMLAB Application example
Helmholtz's equation is solved for a rectangular waveguide
On the entry and exit boundaries we have non-reflecting boundary conditions
The incoming wave is a sinusoid and only the TE10 mode can propagate
The walls are assumed to be perfect conductors
OK
Cancel
520
522
524
526

FIGURE 30

530

$$\Delta E_z + (2\pi i k)^2 E_z = 0$$

532

$$k = \frac{1}{\lambda} = \frac{f}{c}$$

534

$$\bar{n} \cdot (\nabla E_z) + 2\pi i k_x E_z = 4\pi i k_x \sin\left(\frac{\pi}{d}(y - y_0)\right)$$

536

$$k^2 = k_x^2 + k_y^2$$

538

$$k_x = \sqrt{\frac{1}{\lambda^2} - \frac{1}{(2d)^2}}$$

540

$$n \cdot (\nabla E_z) + 2\pi i k_x E_z = 0$$

542

$$E_z = 0$$

544

$$f_c = \frac{c}{2d}$$

FIGURE 31

550

```
function obj = flwaveguide(varargin)
%FLWAVEGUIDE Constructor for a Waveguide application object.

obj.name = 'In-Plane Waveguide';
obj.parent = 'flpdeac';

% FLWAVEGUIDE is a subclass of FLPDEAC:
p1 = flpdeac;
obj = class(obj,'flwaveguide',p1);
set(obj,'dim',default_dim(obj));
```

FIGURE 32

552

**fem.user fields**

| Field | Description |
|---|---|
| geomparam | 1-by-2 structure of geometry parameters. |
| entrybnd | Index to the entry boundary. |
| exitbnd | Index to the exit boundary. |
| freqs | Frequency vector |

FIGURE 33

fem.user fields

554

| Field | Description |
|---|---|
| startpt | Index of the lower left corner point of the waveguide. |
| type | Type of waveguide. (*'straight* or *'elbow*) |

FIGURE 34

geomparam fields

556

| Field | Description | Defaults for elbow | Defaults for straight |
|---|---|---|---|
| entrylength | Length of the entrance part of the waveguide. | 0.1 | 0.1 |
| exitlength | Length of the exit part of the waveguide. | 0.1 | Not used |
| radius | Outer radius of the waveguide bend. | 0.05 | Not used |
| width | Width of the waveguide. | 0.025 | 0.025 |
| cavityflag | Turn resonance cavity *on* or *off*. | 0 | 0 |
| cavitywidth | Width of the resonance cavity. | 0.025 | 0.025 |
| postwidth | Width of the protruding posts. | 0.005 | 0.005 |
| postdepth | Depth of the protruding posts. | 0.005 | 0.005 |

FIGURE 35

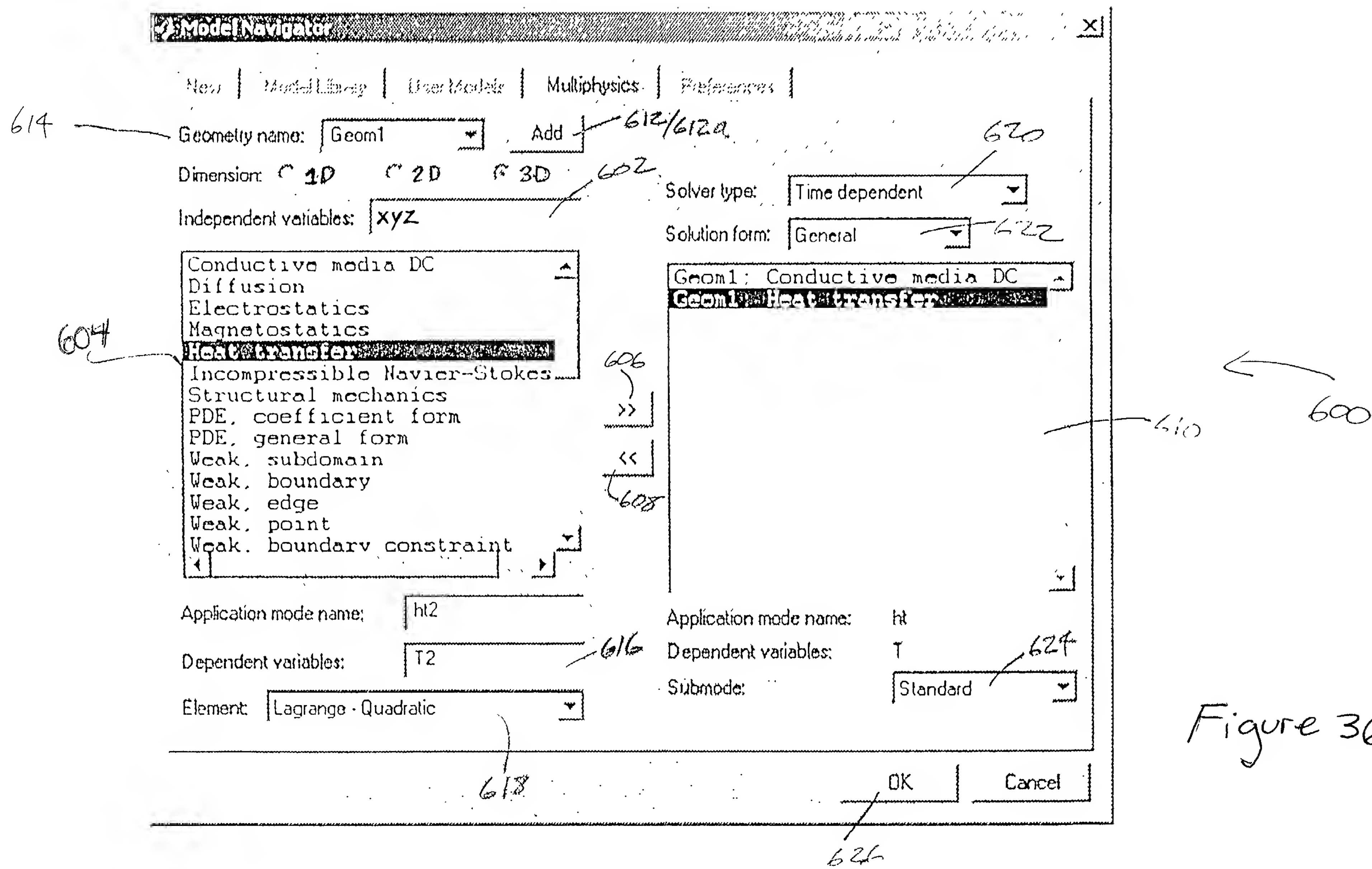
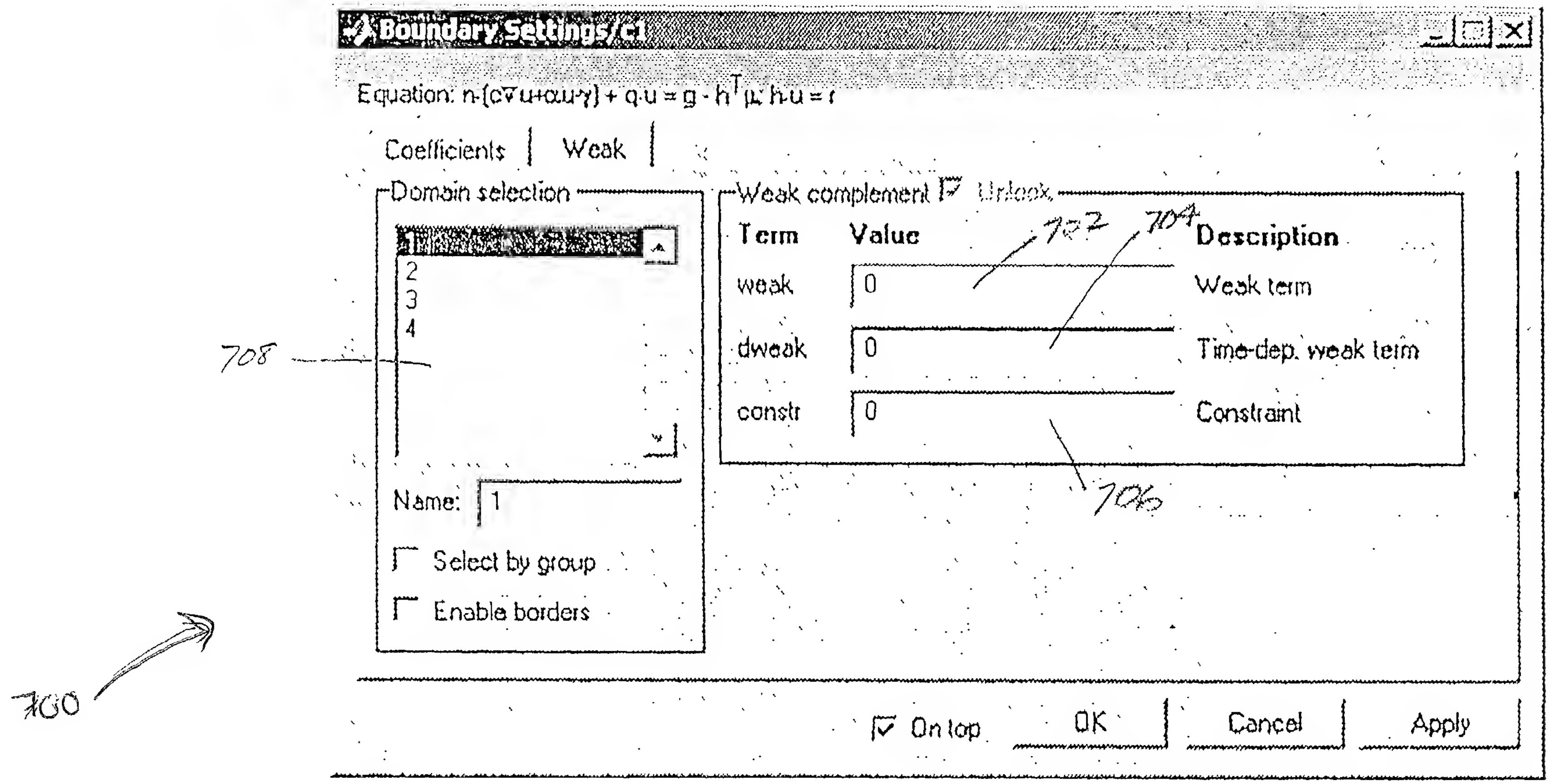
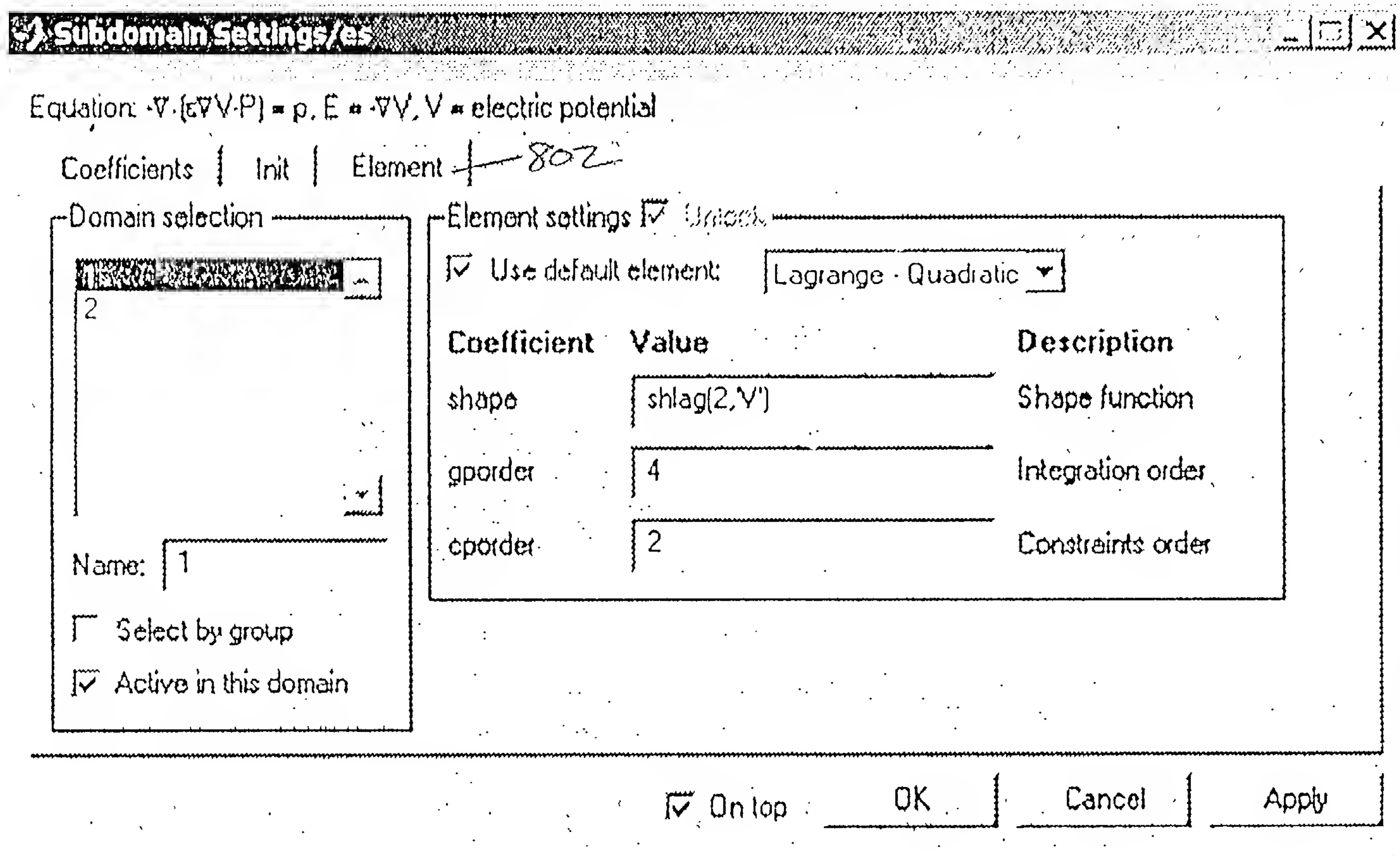

Model Navigator
New
Model Library
User Models
Multiphysics
References
Geometry name:
Geom1
Add
Dimension:
1D
2D
3D
Independent variables:
xyz
Conductive media DC
Diffusion
Electrostatics
Magnetostatics
Heat transfer
Incompressible Navier-Stokes
Structural mechanics
PDE, coefficient form
PDE, general form
Weak, subdomain
Weak, boundary
Weak, edge
Weak, point
Weak, boundary constraint
Application mode name:
ht2
Dependent variables:
T2
Element:
Lagrange - Quadratic
Solver type:
Time dependent
Solution form:
General
Geom1: Conductive media DC
Geom1: Heat transfer
Application mode name:
ht
Dependent variables:
T
Submode:
Standard
OK
Cancel
614
612/612a
602
604
606
608
610
616
618
620
622
624
626
600

Figure 36



Boundary Settings/c1
Equation: n·(c∇u+αu-γ) + q·u = g - h^T μ; h·u = r
Coefficients
Weak
Domain selection
1
2
3
4
Name: 1
Select by group
Enable borders
Weak complement
Unlock
Term
Value
Description
weak
0
Weak term
dweak
0
Time-dep. weak term
constr
0
Constraint
On top
OK
Cancel
Apply
700
702
704
706
708

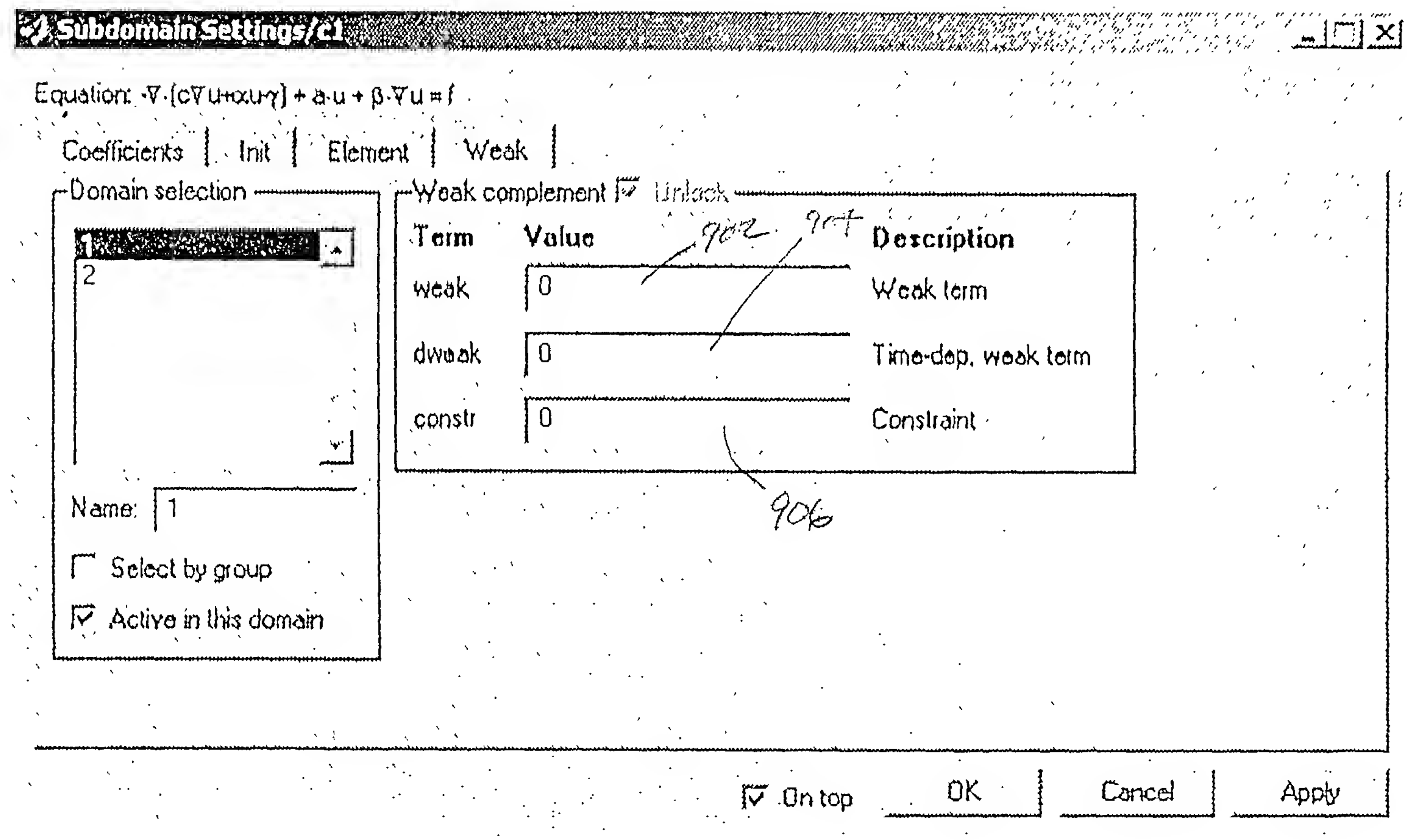

Figure 37




802

800

Figure 38




↑ 900

Figure 39

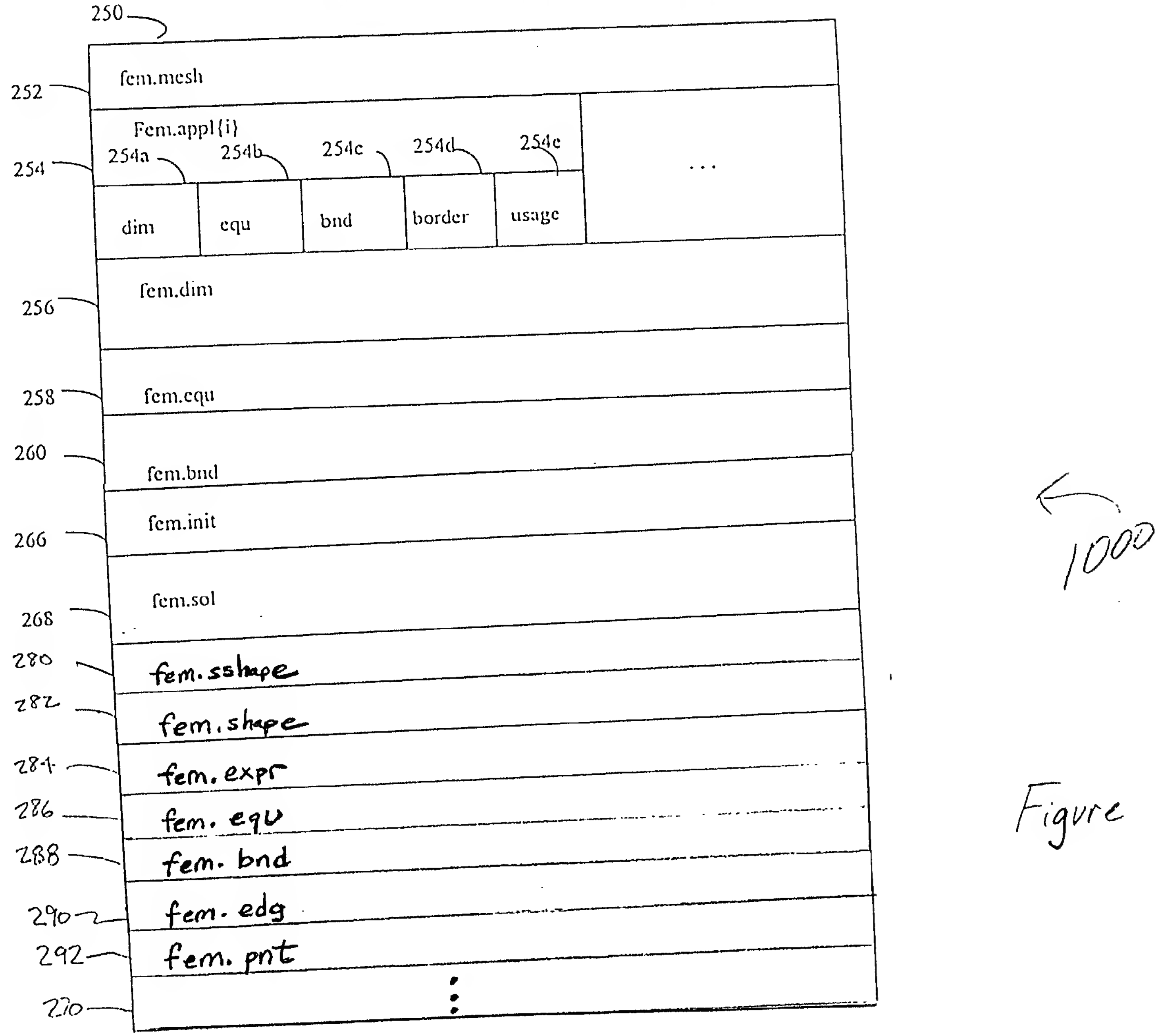

250
252
fem.mesh
254
Fem.appl{i}
254a
254b
254c
254d
254e
dim
equ
bnd
border
usage
...
256
fem.dim
258
fem.equ
260
fem.bnd
266
fem.init
268
fem.sol
280
fem.sshape
282
fem.shape
284
fem.expr
286
fem.equ
288
fem.bnd
290
fem.edg
292
fem.pnt
220
1000

Figure 40

1102

$$
\begin{aligned}
0 = &\int_{\Omega} W^{(2)}\,dA + \int_{B} W^{(1)}\,ds + \sum_{P} W^{(0)} + \\
&+ \int_{\Omega} v_l \frac{\partial R_m^{(2)}}{\partial u_l}\,\mu_m^{(2)}\,dA + \int_{B} v_l \frac{\partial R_m^{(1)}}{\partial u_l}\,\mu_m^{(1)}\,ds + \sum_{P} v_l \frac{\partial R_m^{(0)}}{\partial u_l}\,\mu_m^{(0)}
\end{aligned}
$$

1104

$$
\begin{aligned}
0 &= R^{(2)} \quad \text{on } \Omega \\
0 &= R^{(1)} \quad \text{on B} \\
0 &= R^{(0)} \quad \text{on P}
\end{aligned}
$$

1100

Figure 41

$$W_l^{(n)} = W_l^{(n)} + \Gamma_{lj}\frac{\partial v_l}{\partial x_j} + F_l v_l$$

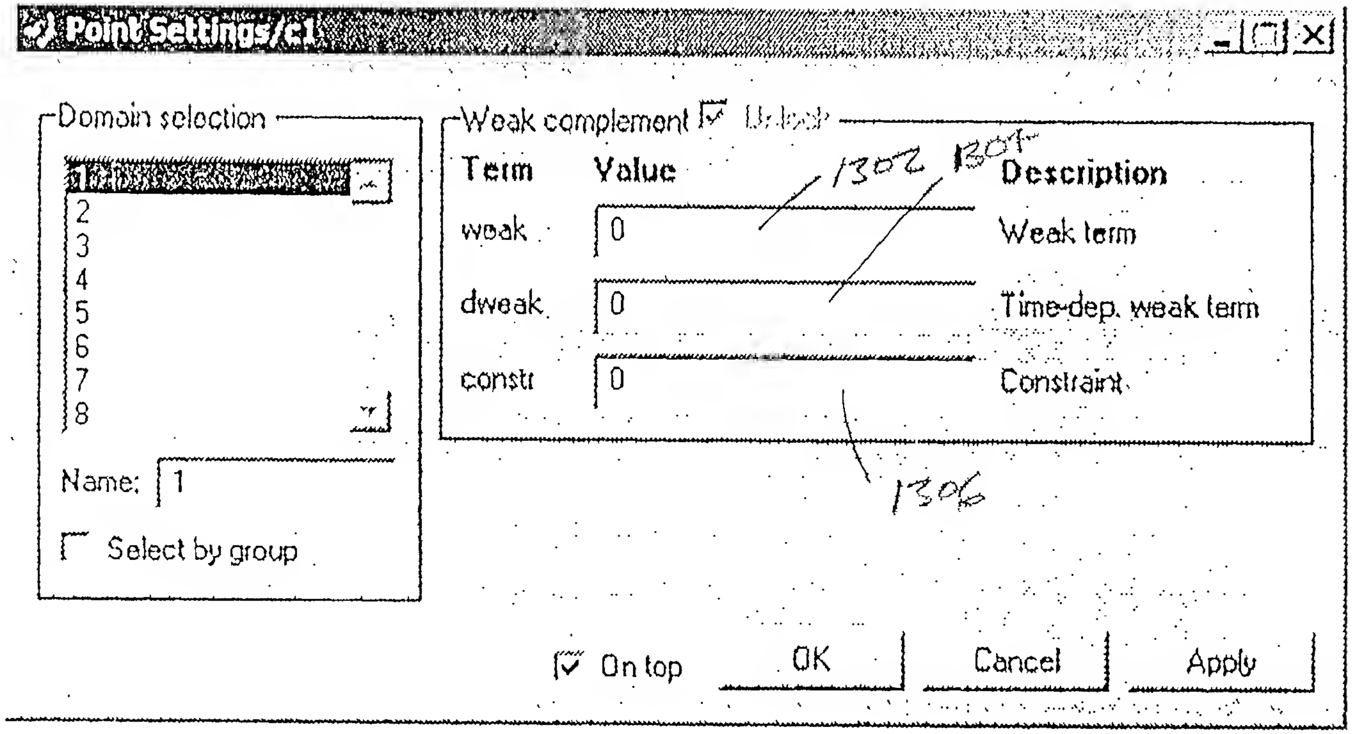
$$W_l^{(nt)} = W_l^{(nt)} + d_{alk}\frac{\partial u_k}{\partial t} v_l$$

$$W_l^{(n-1)} = W_l^{(n-1)} + G_l v_l$$

$$R_m^{(n)} = R_m$$

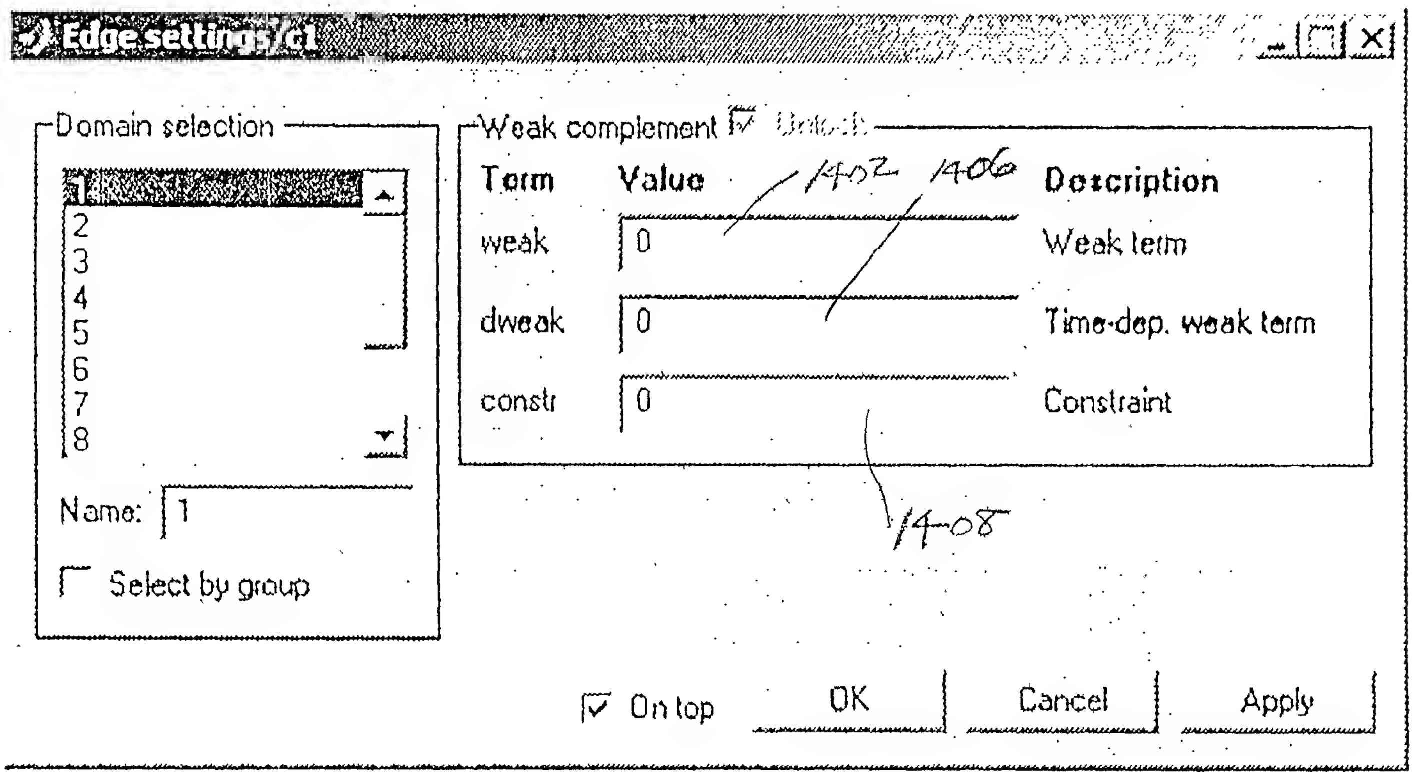
1200

Figure 42




1300

Figure 43




1400

Figure 44

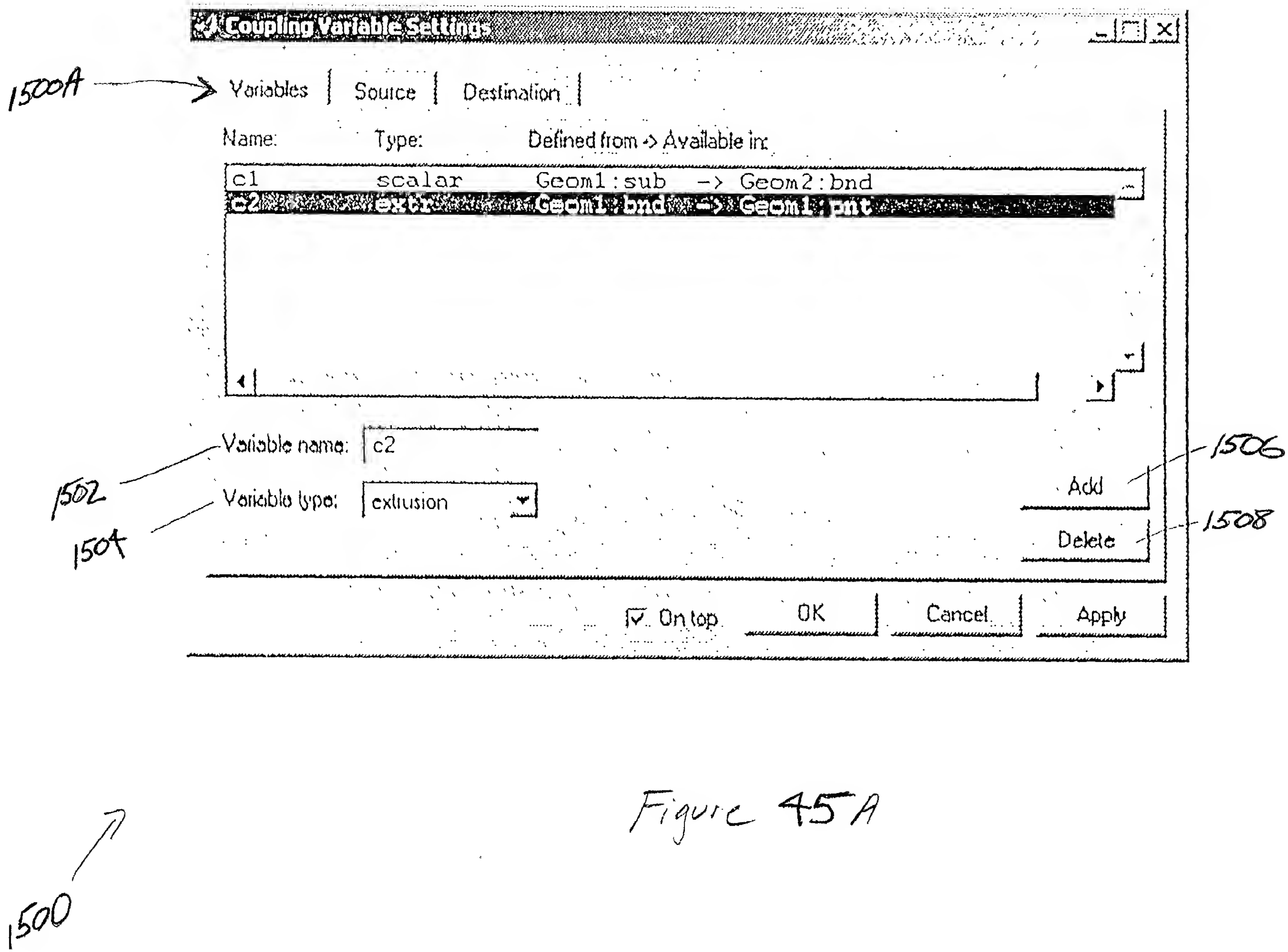

Coupling Variable Settings
1500A
Variables
Source
Destination
Name:
Type:
Defined from -> Available in:
c1 scalar Geom1:sub -> Geom2:bnd
c2 extr Geom1:bnd -> Geom1:pnt
Variable name:
c2
Variable type:
extrusion
1502
1504
Add
Delete
1506
1508
On top
OK
Cancel
Apply
1500

Figure 45A

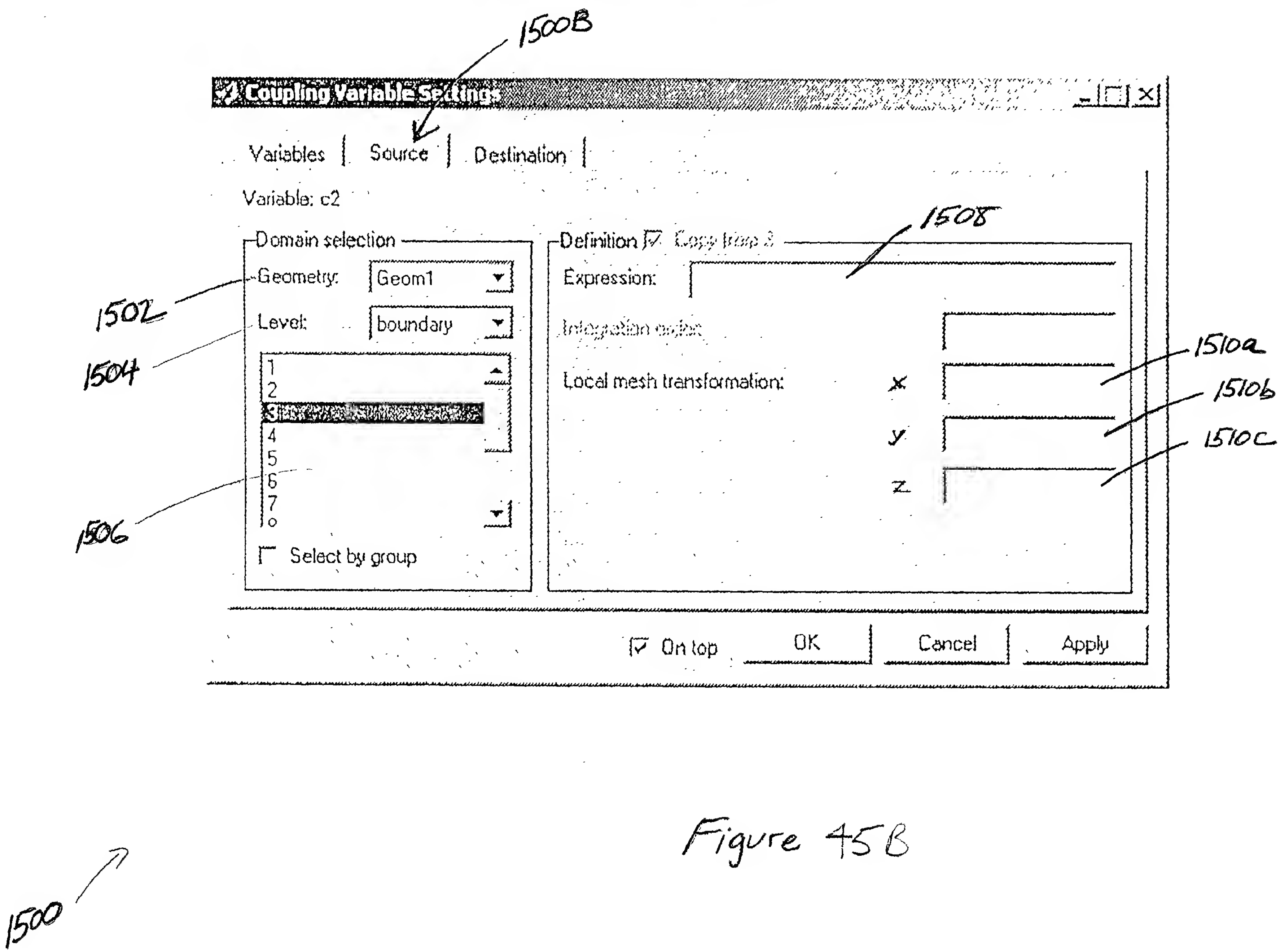

1500B
Coupling Variable Settings
Variables
Source
Destination
Variable: c2
Domain selection
Geometry:
Geom1
Level:
boundary
1
2
3
4
5
6
7
Select by group
Definition
Expression:
Local mesh transformation:
x
y
z
1502
1504
1506
1508
1510a
1510b
1510c
On top
OK
Cancel
Apply
1500

Figure 45B

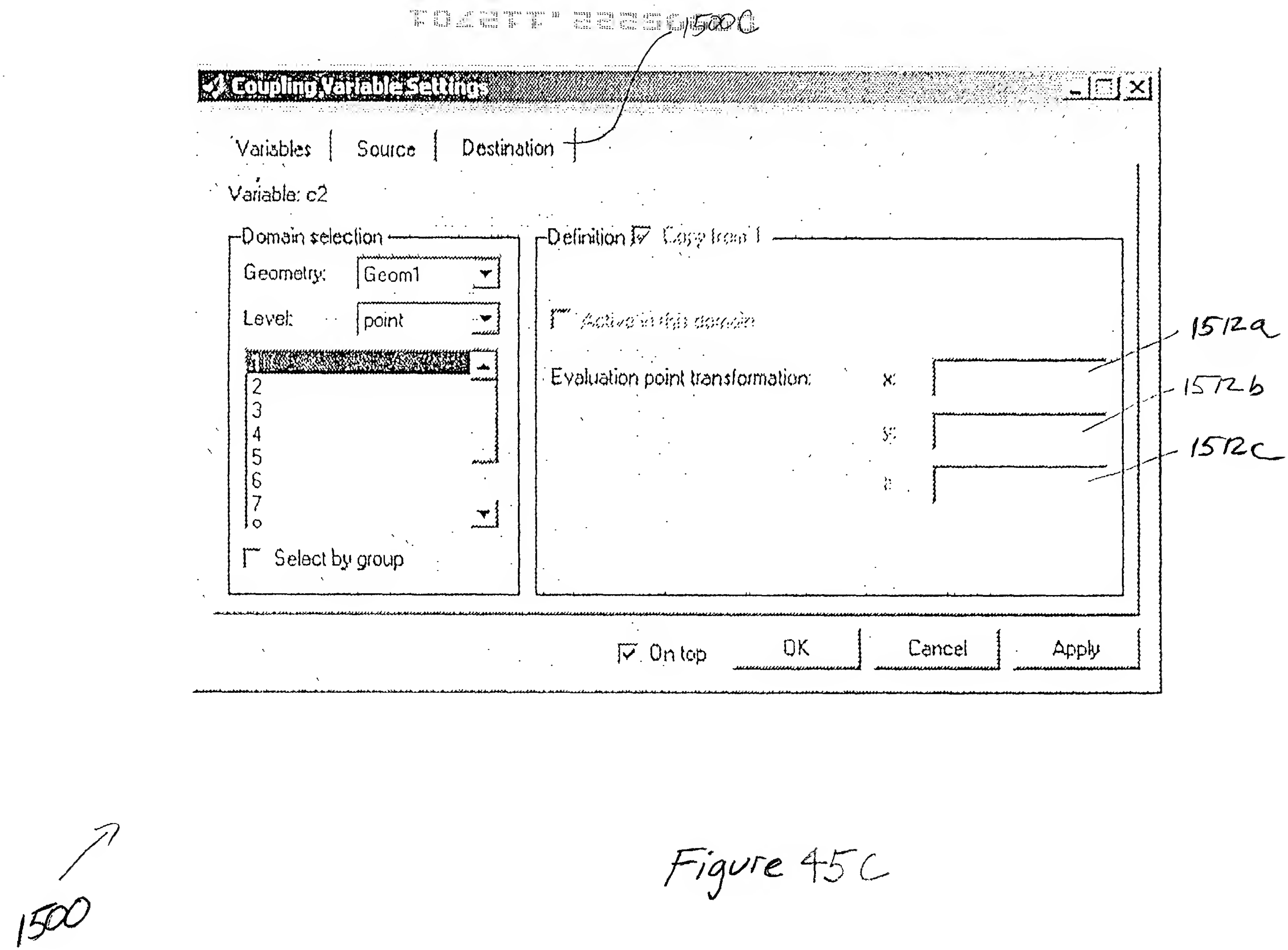

1500C
Coupling Variable Settings
Variables
Source
Destination
Variable: c2
Domain selection
Geometry:
Geom1
Level:
point
1
2
3
4
5
6
7
Select by group
Definition
Evaluation point transformation:
x:
1512a
1512b
1512c
On top
OK
Cancel
Apply
1500

Figure 45C

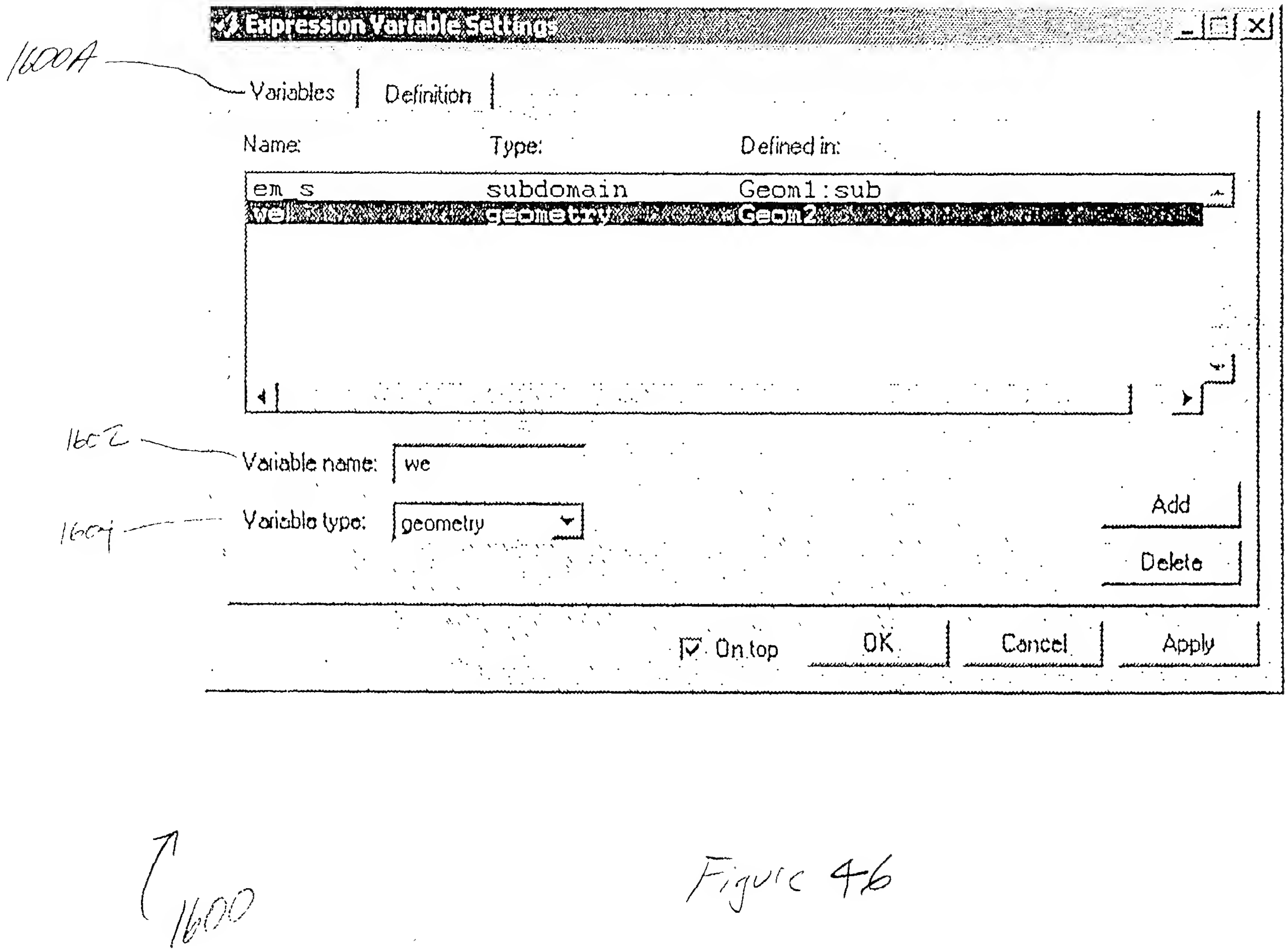
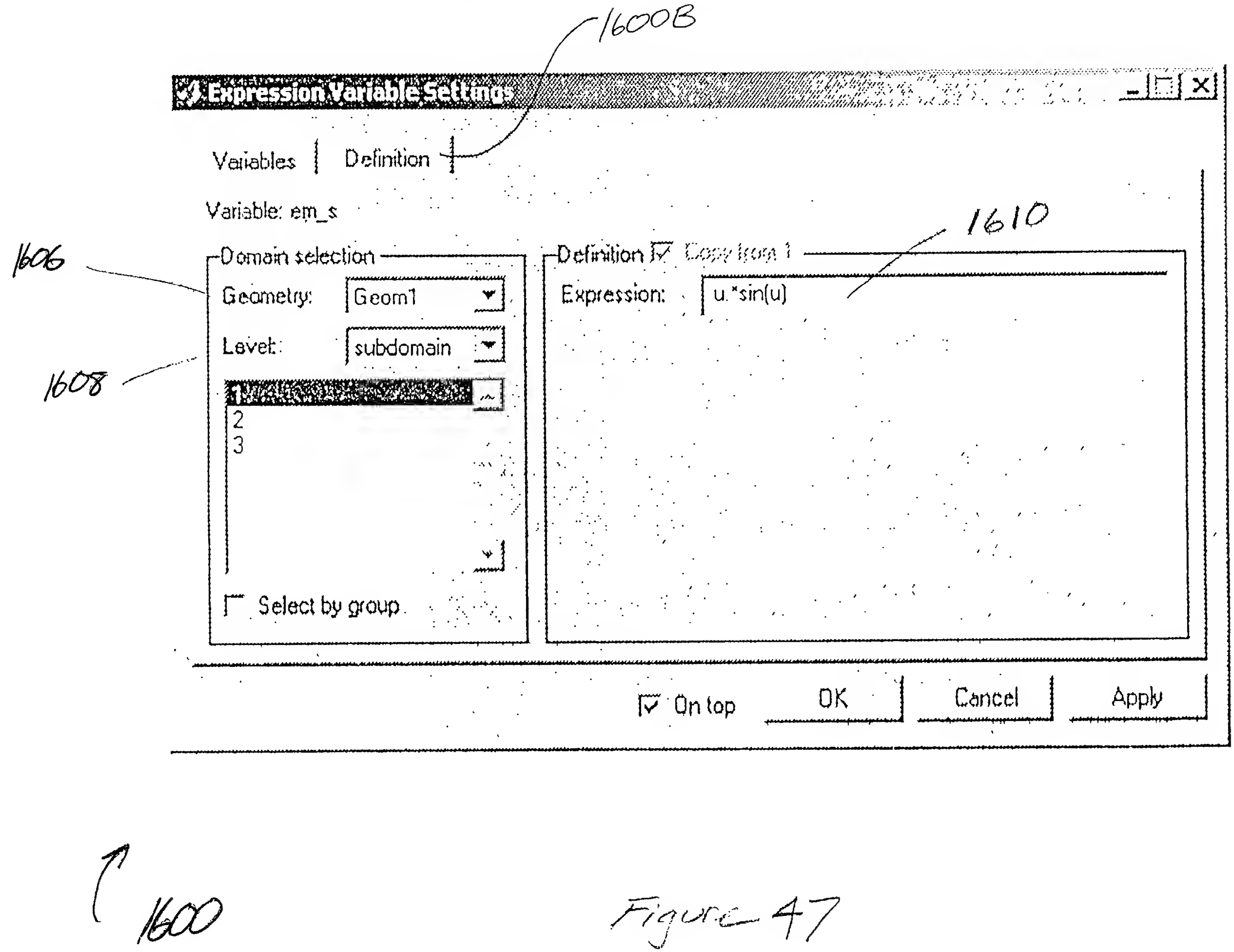
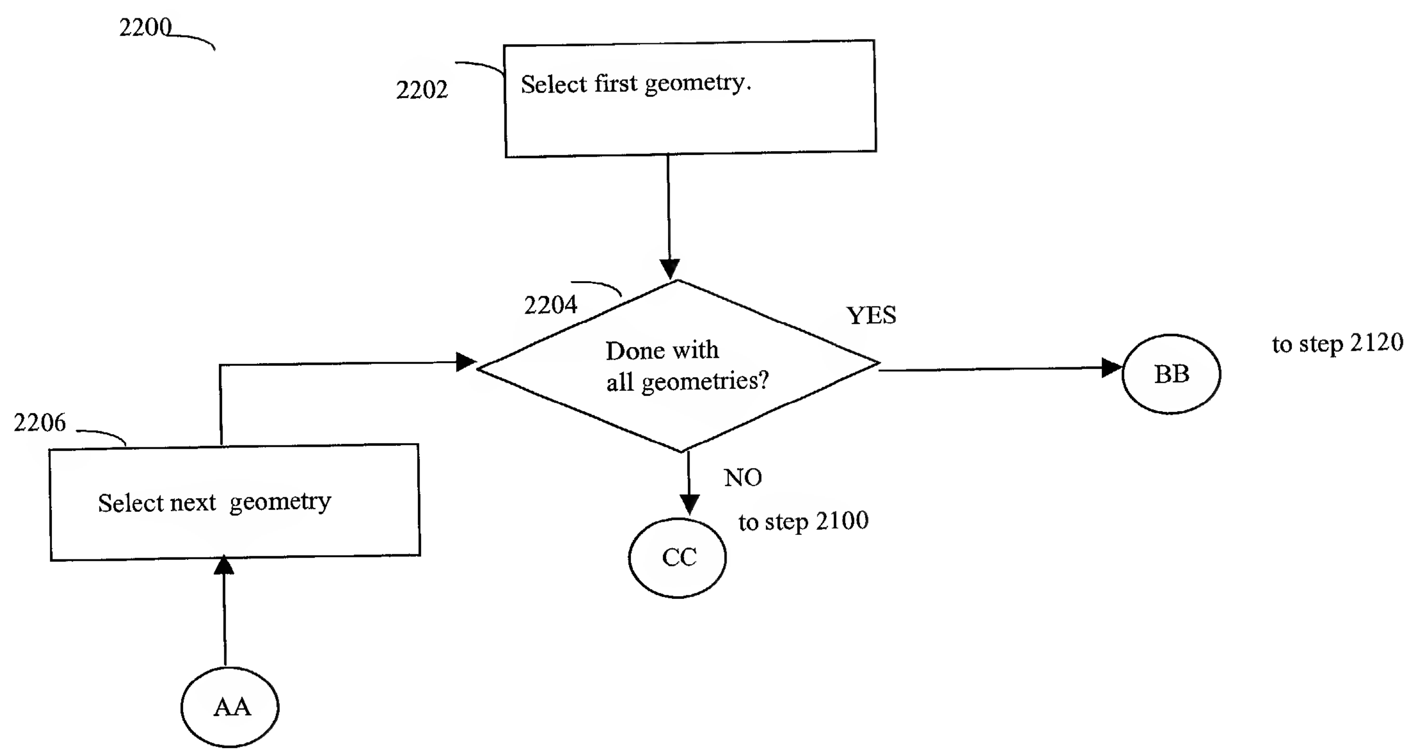

1600A
1602
1604
Expression Variable Settings
Variables
Definition
Name:
Type:
Defined in:
em_s
subdomain
Geom1:sub
we
geometry
Geom2
Variable name:
we
Variable type:
geometry
Add
Delete
On top
OK
Cancel
Apply
1600

Figure 46



1600B
Expression Variable Settings
Variables
Definition
Variable: em_s
Domain selection
Geometry:
Geom1
Level:
subdomain
1
2
3
Select by group
Definition
Copy from 1
Expression:
u.*sin(u)
1610
1606
1608
On top
OK
Cancel
Apply
1600


Figure 47



2200
2202
Select first geometry.
2204
Done with
all geometries?
YES
BB
to step 2120
NO
CC
to step 2100
2206
Select next geometry
AA


FIGURE 48

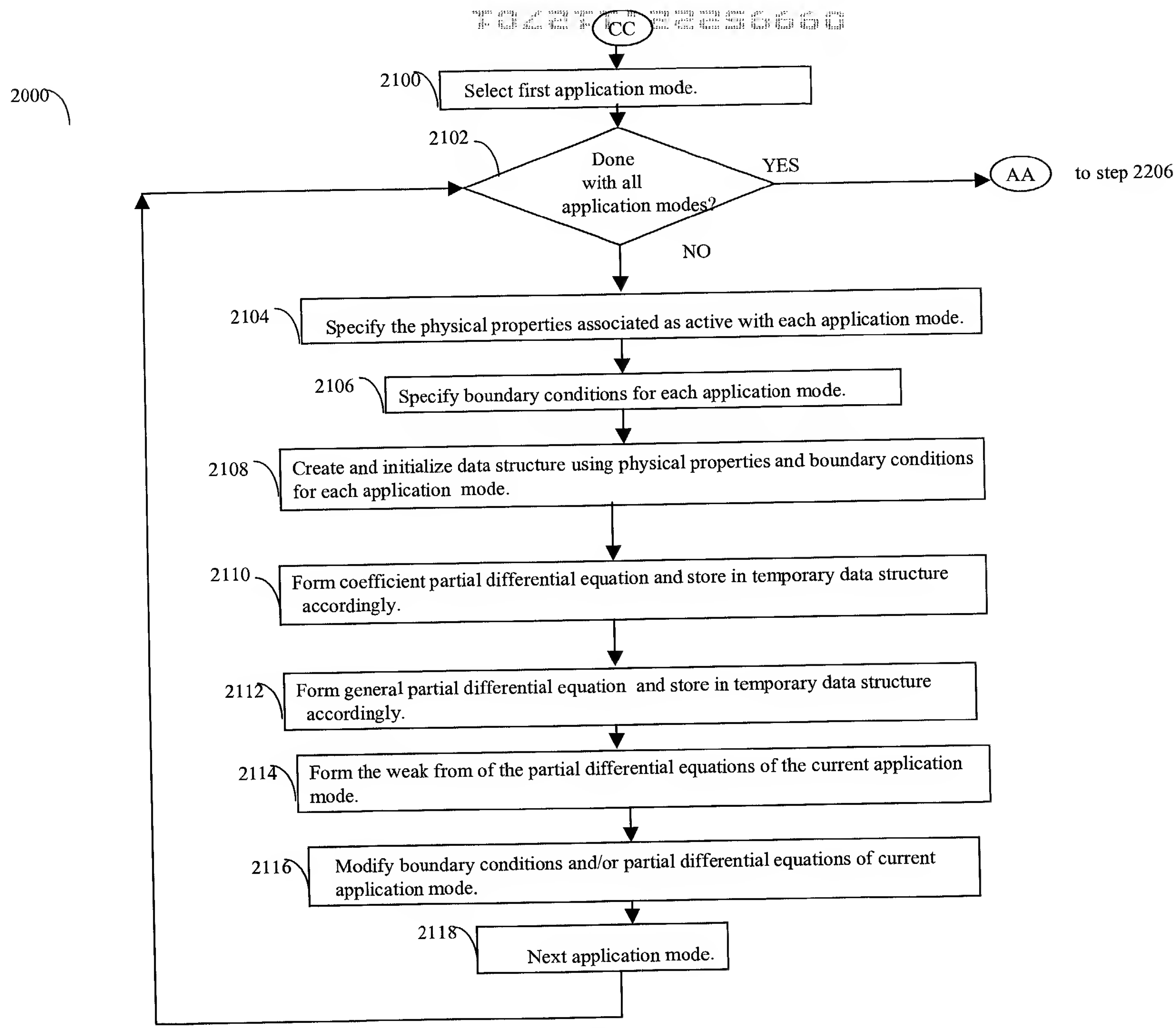

2000
CC
2100
Select first application mode.
2102
Done with all application modes?
YES
AA
to step 2206
NO
2104
Specify the physical properties associated as active with each application mode.
2106
Specify boundary conditions for each application mode.
2108
Create and initialize data structure using physical properties and boundary conditions for each application mode.
2110
Form coefficient partial differential equation and store in temporary data structure accordingly.
2112
Form general partial differential equation and store in temporary data structure accordingly.
2114
Form the weak from of the partial differential equations of the current application mode.
2116
Modify boundary conditions and/or partial differential equations of current application mode.
2118
Next application mode.

FIGURE 49

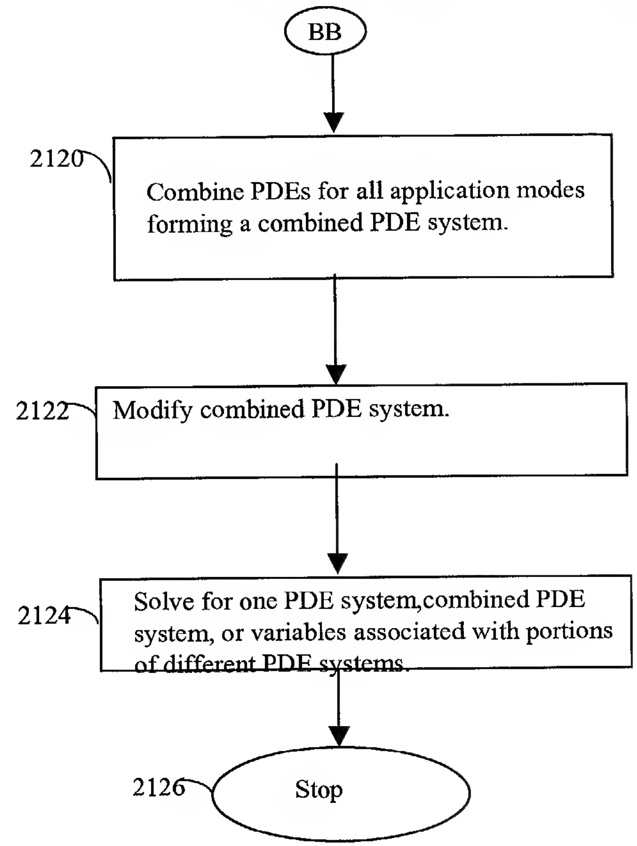

BB
2120
Combine PDEs for all application modes forming a combined PDE system.
2122
Modify combined PDE system.
2124
Solve for one PDE system,combined PDE system, or variables associated with portions of different PDE systems.
2126
Stop

FIGURE 50